Dental

Abstracts

a selection of world dental literature

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Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
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SECTIONS

Anatomy *page* 390
Anesthesia and analgesia *page* 396
Case reports *page* 415
Endodontics *page* 405
Extractions *page* 407
General *page* 439
Histology *page* 429
Oncology *page* 387
Operative dentistry *page* 393
Oral surgery *page* 402
Orthodontics *page* 411
Pathology *page* 433
Pedodontics *page* 409
Periodontics *page* 413
Prosthetic dentistry *page* 399
Public health dentistry *page* 425
Roentgenology *page* 418
Therapeutics *page* 421
New equipment *page* 443
Doctoral and Masters' dissertations *page* 444

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Oncology

Chronic radium poisoning in a dial painter: case report

James A. Glenn, Jr., Joseph Galindo and Clinton E. Lawrence. *Am.J.Roentg.* 83:465–473 March 1960

Poisoning caused by radioactive substances is constantly assuming greater significance. Attention has been focused in the ingestion of strontium from fall-out of nuclear weapon testing. Instances have been reported of polonium and plutonium absorbed by the human body in industries. The possibility of irreversible changes by ingestion of radioactive substances exists, and preventive procedures should be initiated.

Many dial painters have unknowingly loaded their skeletons with lethal amounts of internal radioactive emitters. These tragedies of the last half century must not be allowed to occur again.

The case represented concerns a white woman, born in 1900, who has been a long-term survivor from a group of luminous watch dial painters employed in a New Jersey plant more than 40 years ago. The paint consisted of zinc sulfide, radium and (or) mixtures of mesothorium salts. After leaving the plant, the patient apparently enjoyed a healthy life until 1928, ten years from the time of the last exposure to radioactive materials. On May 30, 1928, she sustained a fracture of the right femur which required 12 weeks for firm callus formation. In 1929, she sustained a second pathologic fracture of the right femur, about three inches above the previous fracture site. The fracture failed to unite.

In 1930, it was suspected for the first time that her previous occupation as a dial painter was responsible for the bone condition. The roentgenographic changes showed the characteristic features of radiation osteitis.

In 1931, pain in her jaws developed and several teeth were extracted. Eventually, all teeth were removed because of partial absorption of the roots.

In 1949, roentgenographic examinations showed an extensive radium necrosis involving the pelvis, extremities, spine, mandible and skull. There was no evidence of intracranial tumor.

The headaches which had been retro-orbital shifted to the left temporoparietal region, tending to radiate into the maxillofacial region. The mouth was edentulous; the thyroid gland contained a small nodule.

Roentgenographic findings, in 1955, revealed an extensive destruction of the cranial vault with

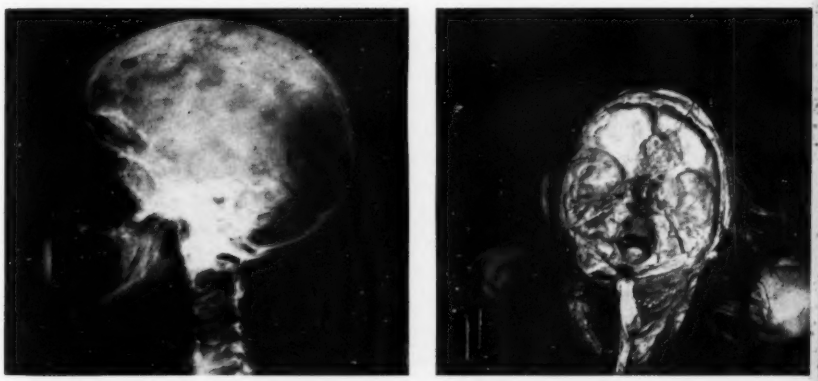

Figure 1 Left: Roentgenogram of skull taken four years before death. There are multiple, irregular, well demarcated areas of bone destruction, normal sella turcica and clinoid processes, thin occipital and parietal bones, profoundly atrophied alveolar process and absence of all teeth. Right: View of cranium taken at autopsy, showing the tumor on the roof of the right orbit and a mass invading and protruding the sella turcica

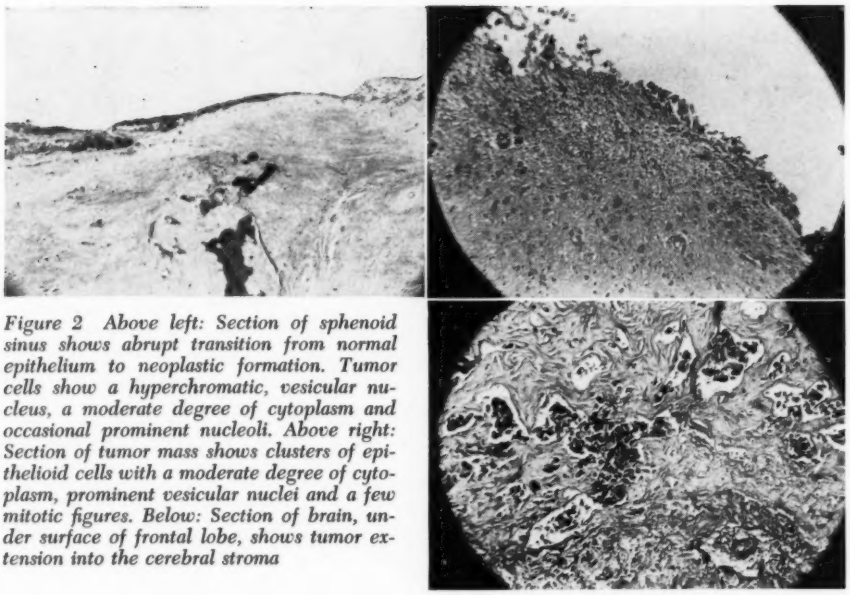

Figure 2 Above left: Section of sphenoid sinus shows abrupt transition from normal epithelium to neoplastic formation. Tumor cells show a hyperchromatic, vesicular nucleus, a moderate degree of cytoplasm and occasional prominent nucleoli. Above right: Section of tumor mass shows clusters of epithelioid cells with a moderate degree of cytoplasm, prominent vesicular nuclei and a few mitotic figures. Below: Section of brain, under surface of frontal lobe, shows tumor extension into the cerebral stroma

profound thinning and destruction of the sella turcica and dorsum sellae.

Although the patient had failed to respond to cortisone, meticortone was administered (40 mg. daily for one week) without alleviation of pain. The persistent pain required the administration of narcotics for temporary relief, but the patient soon became tolerant to these drugs.

In 1955, the patient was unable to move her jaw, and it became impossible for her to chew, swallow or talk. A carcinoma which arose in the right sphenoidal sinus was probably the late effect of the prolonged radioactivity to which the patient's tissues were subjected. The patient died on September 21, 1957.

An autopsy revealed that the radium and mesothorium which had been permanently deposited in the skeleton had produced weakness or brittleness of all the bones. The damage was caused by the internal emission of alpha particles. Since bone growth was proceeding at the time of deposition of the radioactive substances, when the patient was 17 years old, the epiphyseal plate areas showed extensive laying down of calcium.

The patient had survived 37 years after exposure. During this period she suffered multiple pathologic fractures, osteomyelitis of the mandible, resorption of the roots of all teeth, mastoiditis and a generalized radiation osteitis, total blindness, intractible headaches and pain in the maxillofacial region.

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An interview [ectopic salivary gland tumors]

V. M. Dalley. *Cancer Bul.* 11:86 Sept.-Oct. 1959

Of 420 patients with tumors of the major salivary glands seen at the Royal Marsden Hospital between 1933 and 1958, only 89 patients had ectopic salivary gland tumors. These ectopic tumors occur mostly in the head and neck region; in this region, the hard palate and the paranasal sinuses were the most common sites, although lesions also were found in the nasopharynx, base of the tongue, and the oropharynx. Although ectopic tumors occur less often than those in the major salivary glands, they are more often malignant, especially in male patients.

The most frequent sign is a nonulcerated and sometimes lobulated swelling. Ulcerated regions, if present, are small in comparison to the size of the swelling, and the symptoms vary with the site of the tumor. For example, in patients with neoplasms of the hard palate, the swelling may be

painless and of relatively long duration, perhaps as long as two years. In patients with tumors of the soft palate, pain and discomfort usually will be present.

Diagnosis cannot be made from clinical examination. Punch biopsy customarily is used, although if the neoplasm is small, excision biopsy may be carried out. The preferred treatment is a combination of roentgenotherapy and surgical intervention.

Because recurrence is frequent, the patient should be seen every month postoperatively for six months, and then at regular intervals in order that any recurrence may be detected.

Royal Marsden Hospital, London, England

Rational methods for the combined treatment of cancer of the tongue

Iu. V. Petrov and V. A. Gremilov. *Prob.Oncol.* 4:325-331 Sept. 1959

From 1945 to 1955, 122 patients with primary cancer of the tongue were treated at the Institute of Oncology, Leningrad. The results of treatment are analyzed. The patients included 88 men and 56 women. The tumors in 103 of the 122 patients were squamous cell keratinizing carcinomas.

Patients were divided into three groups, according to the nature of the first stage of the treatment.

In the 19 patients in group A, who had sought advice in the very early stages of the disease, treatment began with removal of the tumor by excision with the scalpel, by electrocautery or by electrocoagulation. This was supplemented by the immediate insertion of six to eight radium needles into the edge of the sutured wound. This radium treatment within the tissue was continued for from three to five days; the total dose varied from 4,000 to 9,000 r. Cure of the primary tumors was achieved in 16 of 19 patients (84.2 per cent). Three years after treatment, 7 of the 16 patients (43.8 per cent) were still healthy, although 4 of the patients had not even had the cervical lymph nodes excised.

In the 68 patients in group B, with stage I cancer in the posterior third of the tongue or with cancer in stages II or III, treatment began with external irradiation, using an applicator mask or a GUT-20 apparatus, to provide a skin dose of 7,000 to 8,000 r. The tumor disappeared completely in 3 of the 68 patients. In 29 patients, after external irradiation, the tumor remnants were excised 20 to 35 days later and the edges of the wound pinned with radium needles. A cure was thus obtained in an additional 18 persons. In 3 other patients, the decrease in size of the tumor after external radiation was so considerable that the tumor remnants were treated only with interstitial radium, without electrosurgery; the cancer was cured in 2 patients. In the remaining 33 patients, it was not possible to use any supplementary measures, either because of the progressive nature of the neoplastic process or as a result of the development of complications. Thus, cure of the primary lesion was achieved in 23 of the 68 patients (33.8 per cent) in group B. However, a three-year cure was obtained in only 21.5 per cent of the patients.

In the 35 patients in group C, treatment began with irradiation by a GUT-20 apparatus in skin doses of from 5,040 to 10,975 r, using one or two fields. Complete resolution of the tumor occurred in 2 patients; in 15 patients there was a considerable decrease in tumor size, and treatment was supplemented with the interstitial insertion of radium needles; tongue tumors were cured by this means in 11 patients. In an additional 10 patients, the decrease in tumor size produced by radiation was less pronounced. The remnants of the tumor were excised and radioactive needles were inserted into the tissue of the tongue. A cure was achieved by these methods in 6 patients. In the remaining 8 patients in group C, supplementary methods of treatment could not be undertaken. In group C, cure of the primary lesion was seen in 19 of 35 patients (54.3 per cent).

A three-year cure was obtained in 64.3 per cent of patients with the tumor at stage I; in 22.5 per cent in stage II, and in 14.8 per cent in stage III of primary cancer of the tongue. Five-year cures were obtained in 62.5, 22.2 and 12.5 per cent, respectively. The small differences between the three-year and five-year figures show that patients cured for three years have good chances of further success.

Institute of Oncology, Leningrad, U.S.S.R.

Anatomy

Differentiation in root development of lower first bicuspids

Th. E. De Jonge. *Tschr.tandheelk.* 66:607–629 Aug.–Sept. 1959

The morphologic development of human teeth is adapted to the structural composition of the crown. This genetic relationship is a common characteristic of all tooth types with the exception of lower first bicuspids.

The crown of the lower first bicuspid differs from that of the other teeth in that it exhibits considerable differentiation in form. Such an uncomplicated type of crown hardly requires more than an indifferent root formation (Fig. 1, left). In fact, the root development of lower first bicuspids deviates from that of the other teeth by having the convex distal root surface considerably narrower than the flattened mesial surface (Fig. 1, right). The buccal root surface gradually curves to merge with the distal surface. The boundary between the buccal and the mesial surfaces of the roots, however, is sharply defined, whereas the junction between the lingual root surface and the two proximal surfaces is hardly discernible.

These differentiations in root development of lower first bicuspids indicate that a morphologic evolution took place to produce a complete adaptation to the phylogenic development of a simple crown type.

The almost complete accord between crown and root differentiation in lower first bicuspids seems not to require special consideration. Morphologic investigations of lower first bicuspids, carried out at the anatomic-morphologic department of the University of Amsterdam, The Netherlands, demonstrated that this congruence between crown and root development occurred in only 666 out of 1,990 lower first bicuspids examined; that is, in not more than 33 per cent.

The roots of the remaining 1,324 lower first bicuspids showed a more or less profound degree of definite structural differentiation, especially at their anteromesial surfaces where a cervicoapical groove divides the root surfaces into a wide buccomesial and a narrow linguomesial region.

In some lower first bicuspids a vertical sulcus appears on the buccal root separating a mesiobuccal from a slightly narrower distobuccal segment. This sulcus becomes deeper as the morphologic development becomes more progressive. Ultimately, the mesial sulcus meets the buccal sulcus, thereby dividing the originally hardly differentiated root into a narrow mesial and a wide distal component. Generally, these two root components are either completely or partly fused; only in isolated instances were two entirely separated radices observed.

Phylogenically, this root division cannot be interpreted as a progressive phenomenon because neither a progressive nor a retrogressive root differentiation can be a primary factor in forming two unequal parts. If this specific root differentiation were a progressive developmental phenomenon, the result ought to be a division into two equal parts of the root, that is a distal and a mesial ramus. The root division occurring in lower first bicuspids, however, takes a different course; the original radix develops into an anterior mesiobuccal and a posterior distal ramus (Fig. 2).

This phenomenon, therefore, can be explained only as being atavistic; that is, a root formation reminiscent of an earlier phase in the development of human lower first bicuspids that can be traced back to the development of lower first premolars in *Anthropomorpha* (Fig. 3). In these species of anthropoid apes (and in certain Homonidae), the narrow mesial radix is bordered by a wide distal radix.

This interpretation confirms Romane's hypothesis of the phylogeny of the human cuspid.

In some of the roots of lower first bicuspids, an even more advanced differentiation has taken place. The distal radix divides into a buccal and a lingual component, resulting in a tripartite root structure. In such instances three root rami can be distinguished which, however, nearly always are fused (Fig. 4). During the investigation, only in sporadic instances was a development into three completely separated rami observed which may

Figure 1 Differentiated (left) and undifferentiated (right) root development in lower first bicuspids

Figure 2
Mesiobuccal root differentiation

Figure 3
Buccal root differentiation

Figure 4
Mesial broadening of the crown. Lower first premolar of an anthropoid ape (Troglodytes niger)

Figure 5
Lower jaw of Sinanthropus pekinensis. *The lower first premolars show a possible tripartite root formation*

be designated as mesiobuccal, distobuccal and lingual rami.

Another explanation of the possible causative factors of this extremely rare variety in root differentiation would be purely speculative, because neither the recent platyrhine apes nor the catarrhine apes exhibit a tripartite root structure in lower first premolars.

Investigations of fossil remains such as were carried out by Weidenreich on *Sinanthropus pekinensis* (Fig. 5) and by Broom on *Australopithecinae* were the only studies which demonstrated the possibility of a tripartite root formation in lower first premolars in these species.

A systematic investigation of the root differentiation in recent anthropoid apes (chimpanzee, orangutan and gorilla) may provide evidence to explain the phenomenon of root differentiation in the lower first bicuspids in man.

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Anatomical studies on the position, the arrangement and the calcification of the deciduous tooth germ in the Japanese embryo

Senji Onda. *Shikwa Gakuho.* 59:1-37 Nov. 1959

The position, arrangement and calcification of the germs of deciduous teeth in 110 Japanese embryos were studied macroscopically.

In the five-month embryo, these germs lie near the alveolar ridge, with the sagittal axis inclining lingually. The germs of deciduous teeth are widely spaced at this period.

In six-month embryos, the tooth germs are substantially larger, and are less widely spaced. The direction of the axis of the germs has changed to the sagittal plane. The distance between the tooth germs and the alveolar ridge has increased.

As the embryo matures, the tooth germs change from a parabolic to a round shape.

The germs of anterior deciduous teeth grow faster than the jaw. The germs of the central incisor and cuspid project labially and cover the germs of the lateral incisors.

In the five-month embryo, the calcified portion of the deciduous tooth germs has a sagittal length ranging from 0.4 to to 0.8 mm., accounting for one third of the height of the germs. The calcified portion of the germs thereafter grows rapidly, and in the nine-month embryo ranges in length from 2.0 to 4.0 mm., accounting for two thirds of the height of the germs.

Calcification of the germs of anterior deciduous teeth begins at the center of the occlusal surface and spreads to the cervical margin. In deciduous molar tooth germs, calcification begins with the mesiolingual cusp and spreads to the distolingual and then to the distobuccal cusps.

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Operative dentistry

Shipboard installation of high-speed dental equipment

Roamer C. Carter. *M.Technicians Bul.* 10:140–143 July–Aug. 1959

The three dental units in the dental operating rooms aboard the U.S.S. *Nereus* were equipped with high-speed mechanical handpieces capable of a maximum speed of nearly 100,000 rpm. The units had ball-bearing handpieces, ball-bearing contra-angle handpieces and were belt-driven. The giant pulley wheels provided for placement on the engine were so large that, if used with the three-to-one transmission in the belt system and the two-to-one gear ratio of the ball-bearing contra-angle handpiece, speeds much greater than 100,000 rpm, and beyond the capabilities of the equipment, could be attained. The large wheels were removed and replaced with 1¼-inch wheels and the resistors were restored to the dental engines; these had been removed previously in an attempt to gain more speed.

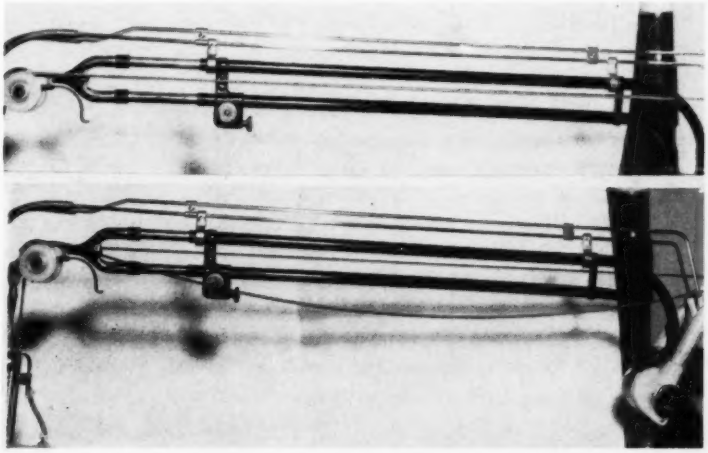
To make the equipment operate even more smoothly, the standard idler pulleys were replaced with nylon pulleys equipped with ball bearings.

A source of added speed often overlooked in dental offices is the proper adjustment of the engine belt (see illustration). The belt should be adjusted loosely in the pulleys so that, when the engine is run at high speeds, the portion of the belt traveling from the engine pulley will have a definite sag. If this is done, as much as one third additional speed may be gained over equipment that is operated with a taut belt.

Equipment of this kind requires the finest care. The ball-bearing contra-angle handpiece with its two-to-one gear ratio cannot be used without some type of automatic oiling system. The system used in the dental offices aboard the U.S.S. *Nereus* depends on a constant stream of air to drive an oil mist through the contra-angle handpiece so that at no time is there any danger of a dry ball bearing. The handpiece and the pulley wheels are oiled daily. One advantage of the automatic oiling system is that any other cleaning is unnecessary; the oil forced through the contra-angle handpiece carries all debris with it.

An ultra high-speed, air turbine handpiece, which approaches speeds of 300,000 rpm, also has been procured and installed. It is secured to the bulkhead between two dental operating rooms in such a way that the unit may be used in either room; the handpiece can be passed back and forth through a small window cut in the bulkhead. It is believed that the U.S.S. *Nereus* is the first ship in the fleet to be equipped with an ultra high-speed, air turbine handpiece.

Dental Technicians School, U.S. Naval Training Center, San Diego, Calif.



Adjustment of engine belt. Above: Improperly adjusted belt is too taut. Below: Properly adjusted belt has a definite sag

Thermoplastified synthetic resin (polystyrene) as a dental filling material

Sven Jarby. *Odont.Tskr.* 67:241-313 July 1959

Since a preliminary investigation had shown that fillings of polystyrene were unable to resist the mechanical influence of mastication and dysfunction, it was decided that only labial, labiogingival and medium-sized proximal cavities were indicated for filling with polystyrene for the present investigation. The polystyrenes tested were chiefly Distrens 100 X (from British Resins Products Ltd.) and P3 (Dansk Polystyrolfabrik).

Inorganic pigments were used to ensure stability of color. The polystyrene was extruded as a cylinder which was divided into short sticks to fit into the chamber of a special injection syringe. The stick form of polystyrene was found to be preferable to the powder form. The use of heated spatulas for filling purposes was found to be unfeasible. An electrically heated syringe with a water-cooled jacket was designed and used.

The cavities were prepared with distinct undercuts. Deep cavities were insulated with oxyphosphate cement. A solution of polystyrene in chloroform was applied in all cavities as a lining. Hawé metal matrix bands or ordinary copper bands were used as matrixes.

When the cavity was ready to be filled, the nozzle of the syringe was introduced into the deepest part of the cavity. The cavity was overfilled as the syringe was withdrawn. After the matrix was removed, the excess resin was ground away and the filling was polished in the usual manner.

Fifty-nine restorations were made in the teeth of 30 patients. The average observation time was nine months. Marginal integrity, color stability, retention and condition of the surface of the filling were recorded at the end of the observation period. Although marginal integrity was found unsatisfactory in approximately 20 per cent of the 59 fillings, the fillings showed an acceptable color stability, retention, and constancy of surface. In only one patient was a pulpitis diagnosed.

It was concluded that it is possible to insert dental fillings of thermoplastic synthetic resins by utilizing their thermoplasticity. An electrically heated syringe with a water-cooled jacket is an appropriate medium for the filling procedure. Prefabricated sticks of synthetic resin of suitable color and dimensions are expedient for the filling method.

Tooth fillings of the two forms of polystyrene tested do not provide satisfactory marginal integrity, even when used on surfaces free from occlusion and articulation. Thermoplastified polystyrene injected into cavities of shallow or medium depth, or injected into deep cavities which are lined with cement, does not appear to cause clinical pulp response to a degree that results in devitalization of the pulp.

Royal Dental College of Copenhagen, Copenhagen, Denmark

Bio-assay of cavity liners under silicate cement fillings in rat incisors

Aphrodite Pappas and Maury Massler. *J.Den.Children* 26:335-342 Dec. 1959

Because the acid in silicate cement fillings is potentially damaging to the dental pulp, the use of a cavity liner or base to protect the pulp is essential. A study was undertaken to test the effectiveness of ten cavity liners under silicate cement fillings placed in the incisors of albino rats. Seven days after the filling procedures were completed, the rats were sacrificed, and sections of the filled lower incisors were stained and studied. Pulpal reactions were graded on a scale running from no reaction through mild, moderate, severe, to very severe reaction.

In 20 control teeth, no liner was used. The following liners were used in experimental teeth: Copalite varnish, Cal-Drox, Handi-Liner, calcium hydroxide powder mixed with water, epoxy resin, Pulpdent liquid, Pulpdent paste, phenol 95 per cent, Chembar, and a thick mix of zinc oxide and eugenol.

All of the liners showed some tendency to reduce the severity of the pulpal reaction. Liners providing moderate protection were Cal-Drox, Copalite varnish, Handi-Liner and an epoxy resin. A group which included calcium hydroxide paste, Pulpdent paste and Pulpdent liquid was designated as showing no reactions, although pulp re-

actions under medium and deep cavities were reduced considerably in severity, compared with pulpal reactions under unlined cavities.

Phenol, Chembar and zinc-oxide eugenol provided very good protection. Zinc oxide-eugenol base provided the most complete protection to the pulp; however, a deep yellow staining of the silicate cement was noted.

It is hoped that similar methods for the bioassay of fillings and liners will be used by manufacturers to test their products before placing them on the market.

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Protection for jacket crown preparations

T. S. Halson. *Bul.5th Dist.D.Soc.(Calif.)* 7:9:14 Nov. 1959

To protect an anterior tooth while a full jacket crown is being constructed, the following technic is recommended:

1. A small metal tray is formed that will cover two teeth on each side of the tooth to receive the jacket crown. The perforated metal blanks used for rubber or silicone material are ideal for these trays.

2. The perforation on the outer side of the tray is covered with a piece of thin, soft boxing wax.

3. A quantity of heavy-bodied silicone impression material sufficient to fill the tray completely is mixed. The tray is placed in the patient's mouth and he is directed to close his mouth tightly until the impression material has set.

4. The impression is removed from the mouth, washed and dried with air. Excess impression material is cut away from the ends of the tray with a sharp knife so that the outline of the cusps of the teeth can be seen.

5. The tooth is prepared for the jacket crown.

6. The prepared tooth is dried and coated generously with petrolatum.

7. A heavy, creamlike mix of an acrylic direct filling material, in an appropriate shade, is made and the silicone impression of the prepared tooth is filled with this mix.

8. The prepared silicone impression is replaced in the patient's mouth. The impressions of the cusps at either end are used as guides in seating the impression. The patient is instructed to close tightly on the tray and hold the position for five minutes.

9. The impression is removed from the mouth, and the acrylic crown is removed with a hoe-type scaler. The crown is placed in water at a temperature of 105°F. for five minutes.

10. Any excess acrylic flash at the gingival margin of the temporary crown is trimmed away with a sharp plug finishing bur. The crown is not polished.

11. A heavy, creamlike mix of zinc oxide powder and eugenol to which 5 to 10 per cent of polystyrene crystals have been added is made. The polystyrene crystals dissolve slowly in eugenol and the mixture should be prepared at least 24 hours before use.

12. The temporary acrylic crown is filled with the afore-mentioned mix and the crown is seated. All excess cement is removed from the gingival margin.

The polystyrene crystals when added to eugenol appear to prevent the zinc oxide-eugenol cement from attacking the acrylic resin, and to cause the cement to set harder.

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Anesthesia and analgesia

Difficulties in measuring objectively the effects of analgesics and placebos

Robert Geffert. *München.med.Wschr.* 101:2355–2357 Dec. 18, 1959

In a well-planned and carefully controlled experiment to measure the pain threshold values in patients with moderate to severe toothache, no objective evaluation of the pain-relieving effects of five known analgesics (which are routinely used in dental practice) and one placebo was obtainable.

The subjective effects of analgesics and placebos, however, could be evaluated by measuring the varying levels of the individual threshold of pain. A newly developed electrometer and the method described by Engelter, Harnisch and Martin (1955) were used in this serial experiment, carried out at the Dental Clinic of the University of Munich, Germany.

The following conclusions could be drawn:

1. Electrometric evaluations of the changes in the threshold of pain in individual patients offer no objective results in determining the effects of analgesics or placebos.

2. In simple blind tests, subjective responses of patients indicated that the placebo administration was effective in adequate relief of pain in 61 per cent of patients.

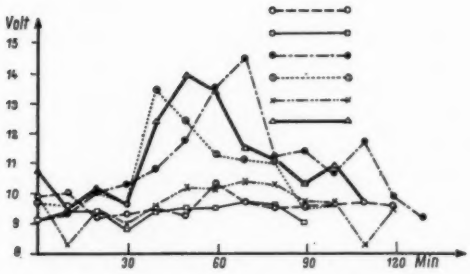

Figure 2 Pain threshold values in double blind test. Broken lines = analgesics. Solid line = placebo. Increase in pain threshold obtained by placebo administration

3. With the same patients and under identical experimental conditions, the electrometrically measured effects of analgesics and placebos could not be reproduced after a period of from one to three months; only the individual level of the pain threshold remained comparatively constant.

4. In patients in whom the effectiveness of the analgesics appeared greater than that of the placebos, there occurred simultaneously with the alleviation of pain an objectively observable increase in the incidence of untoward side effects such as respiratory depression, nausea, constipation and miosis.

5. In the double blind tests, the effect of placebos frequently cannot be distinguished from that of analgesics.

Among the patients there appeared to be a high variability in the suitability to this type of experiment. The reasons for this phenomenon, however, have not been determined.

In this study, the objective pain-relieving effects of mild analgesics and strong analgesics (acetylsalicylic acid, acetanilide, codeine, metha-

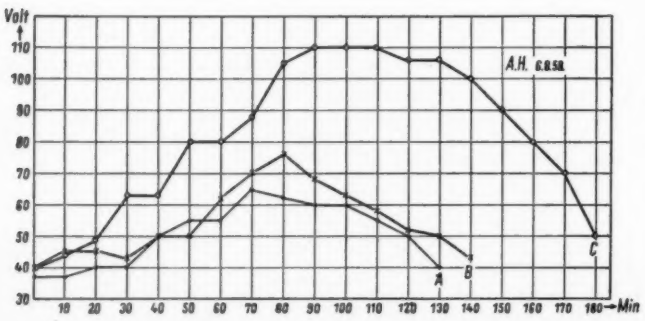

Figure 1 Pain threshold values in simple blind test. A and C = analgesics. B = placebo. The effects of the placebo appeared to be greater than those of the analgesics

done, morphine and nalorphine) and of placebos were difficult to demonstrate, mainly because of the high incidence of adequate relief of pain experienced by many patients after administration of placebos.

Robert Koch Strasse 9, Munich 22, Germany

Measurements of pain sensitivity and the effects of analgesic agents

M. Monje and O. Ritter. *Arzneimitt.Forsch.* 9:753-757 Dec. 1959

Among the electric stimuli of different periodicity, induction currents proved to be suitable for the investigation of individual sensitivity to pain and the effects of analgesic agents. Rectangular currents produced mainly muscular contractions during which the threshold of pain could not be determined with sufficient exactness. Alternating currents caused only prickling sensations and also excluded exact determination of the pain threshold.

An investigation of the sensitivity to pain in patients under the influence of analgesic agents was carried out at the Institute of Applied Physiology of the University of Kiel, Germany.

Measurements of individual pain sensitivity were made in five persons of different age and sex. The individual sensitivity to pain varied widely before and after the administration of analgesic agents. The diurnal rhythms of the autonomic nervous system, however, remained unchanged. In this series, the threshold of pain, established on different days, varied more than the individual values of sensitivity to pain. The difference, however, was statistically insignificant and probably was accidental. The differences found between the results of various individual tests made on the same day and the differences between the results of serial tests made on different days, showed no mean deviation from zero. Individual differences in pain sensitivity and effects of analgesic agents were not associated with age or sex; they may be explained by the method of pain threshold determination.

As analgesic agents, Thomapyrin, containing 0.25 Gm. acetylsalicylic acid, 0.2 Gm. acetophenetidin and 0.05 Gm. caffeine, and a new oxazine derivative, TD 25, Ap. 67, were used. One tablet of Thomapyrin lowered the pain sensitivity in all subjects significantly. The maximum effect was obtained two hours after administration. One tablet of TD 25, Ap. 67, which analgesic has not been tested previously in patients, lowered the pain sensitivity sufficiently in 80 per cent of patients. The analgesic effects of Thomapyrin appear to be less dependent on individual factors than those of the new analgesic agent. This difference probably is due to the comparison of the analgesic effect of a combined preparation with that of a single drug. No side effects were observed after the administration of these drugs.

Because a single test series may easily yield fallacious results, recommendations for use of these analgesic agents in dental and medical practice can be made only after the double-blind technic of testing has been employed in a far larger series of patients.

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Convulsions during anesthesia

R. Kucher, W. Richter and K. Steinbereithner. *Anaesthesist,Berlin* 8:345-349 Dec. 1959

Since 1927, the problem of convulsion during anesthesia (especially ether anesthesia) has been widely discussed in the Anglo-American literature. The first instances of "ether anesthetic" convulsions had been observed as early as 1880. On the European continent, however, this complication of anesthesia is almost unknown.

A case is reported of a five year old boy who had received general anesthesia six times for various surgical interventions. Special features of this unusual case report are the occurrence of short convulsions during two subsequent instances of anesthesia and immediate cessation of the convulsions after deepening of anesthesia.

Convulsions during anesthesia may occur in patients of any age, during operations of any kind regardless of the anesthetic agent (or agents) used, and occasionally even after administration of barbiturates. The symptomatology of convulsions during anesthesia is nonspecific.

The cause for such convulsions is always to be seen in a summation of predisposing factors. In the case reported, they were hypocapnia, hypoglycemia, allergic reaction to the anesthetic, and

chronic intoxication by antibiotics and sulfonamides. In other instances, impairment of the function of the cerebral cells, acute sepsis and subsequent chronic infection, combined with damage to the mucous membranes as well as a latent disposition to convulsion (which can be determined by electroencephalograms) may be the most probable causes. Local or general anesthesia combined with surgical intervention serve only as "trigger" mechanisms.

Treatment of convulsion during anesthesia, especially if occurring at the medical or dental office, consists of an immediate deepening of anesthesia and administration of short-acting barbiturates (if necessary combined with muscle relaxants); the treatment of hypoxic cerebral damage should be started without delay.

First Surgical Clinic of the University of Vienna, Austria

Ambulatory endotracheal anesthesia with trichloroethylene supplement for operative dentistry

Stanley R. Spiro. *J.Am.D.Soc.Anesthes.* 6:7:6-8 Aug.-Sept. 1959

The use of trichloroethylene as a complementary agent to nitrous oxide and oxygen for operative procedures was highly successful in 2,300 patients. Trichloroethylene is a stable, nonexplosive drug which does not cause excessive salivation, bleeding during surgery, or irritation of the respiratory tract. Its most important feature is its ability to help the patient to tolerate the insertion of the endotracheal tube while in a light plane of anesthesia with high oxygen concentration. The disadvantages of trichloroethylene appear to be few. Sensitivities to trichloroethylene do occur, however, and are manifested by bradycardia, arrhythmias and changes in the patient's color. These color changes occurred in less than 4 per cent of the 2,300 patients. Transient arrhythmias occurred in less than 1 per cent. These patients responded readily to removal of trichloroethylene from the anesthetic mixture and a high oxygen flow.

Children usually are premedicated with a rectal suppository inserted about two hours preoperatively. Induction is accomplished by using a face mask delivering a mixture of nitrous oxide and oxygen (75:25). After the analgesic state has been passed, trichloroethylene is added to the mixture so that the patient may reach the first plane, third stage of anesthesia. At induction, a blood pressure apparatus is placed on the patient's arm, a chest stethoscope is taped over the heart and an electrocardioscope is attached, so that the patient's physiologic state can be constantly evaluated and monitored. One hundred per cent oxygen then is administered and the patient given an intravenous injection of succinylcholine in combination with atropine sulfate.

When the patient is in apnea, an endotracheal tube is inserted. The tube is attached to a pediatric to-and-fro semirebreathing apparatus. Respiration is supported until there is complete return of the intercostal muscle activity and an adequate respiratory exchange. A mouth prop is inserted, the pharynx is packed with moistened gauze, and the operative procedure begun. Anesthesia usually is maintained with nitrous oxide and oxygen (60:40) and trichloroethylene. Potential adverse physiologic changes are reduced by emptying the rebreathing bag every three minutes to prevent the overconcentration of trichloroethylene and the possible accumulation of carbon dioxide.

Anesthesia in the adult patient is accomplished with 0.8 per cent methitural sodium injected intravenously, with nitrous oxide and oxygen given by face mask. After the hypnotic stage has been reached, an intravenous injection of 40 to 60 mg. of succinylcholine and 1/150 grain of atropine is given. Direct laryngoscopy and nasoendotracheal intubation is performed and the tube attached to the circle semirebreathing system. Anesthesia is maintained with nitrous oxide and oxygen (65:35) and trichloroethylene. An additional aid is the maintenance of a slow, continuous intravenous drip of succinylcholine 0.10 per cent.

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Prosthetic dentistry

Figure 1 Set of complete dentures with articular spring bow device attached. Left, lateral view; right, posterior view

Articular spring bows for complete dentures

F. Heydenreich. *D.Echo* 29:96–97 May 1959

The fixation of complete dentures frequently is difficult. In many instances in which adhesion and atmospheric pressure are inadequate to provide stabilization the use of some type of retention device is indicated.

The recently developed articular spring bow, a mechanical retention device for sets of complete dentures, keeps the dentures safely, elastically and comfortably in position if the occlusion of the teeth has been balanced properly.

Whenever previous dentures are available and usable, they can be utilized by removing the second molars in the upper and lower dentures to provide adequate space for attaching the articular spring bows.

Newly constructed complete dentures, however, should be fitted with 12 teeth only which have to be aligned in such a manner that the masticatory function is not impaired and increased stresses are produced laterally on the underlying tissues. Smoothly rounded stainless steel bows, fastened to cannulas, are placed on the posterior teeth and anchored to the cuspids and first bicuspids. The bows end in connecting joints placed behind each cuspid of the opposing denture. After the dentures with their retaining devices are inserted and the patient's mouth is closed, each articular spring bow should form a perfect "U." During every movement of the lower jaw, the retention device exerts a slight pressure seating the denture more firmly in position. All forces transmitted to the denture base are perpendicular to the occlusal surface which minimizes lateral displacement. A favorable influence is exerted simultaneously on the ridge crest, preventing distortion of the denture base or resorption of the underlying tissue.

Clinical experience proved that no food particles accumulated in or on the articular spring bow attachments, and that the denture patients soon acquired the habit of chewing more anteriorly and learned the use of phonetics. In construction of complete dentures with these attachments, phonetic considerations are more important than esthetic considerations and, therefore, should be utilized to advantage.

After the articulated models are studied and marked to determine the most efficient placement of the spring bows and connecting joints, the tooth alignment is completed and the dentures can be waxed up, festooned and processed. In most instances it is advisable to attach the spring bows to the upper dentures and the connecting joints to the lower dentures. Routine placement of the parts of the retaining device, however, leads to standard errors which are difficult to correct. If indicated, therefore, the arrangement should be reversed. To correct vertical displacement, the use of two pairs of articulated spring bows is recommended. In this type of retention device the springs are shorter and the use of connecting joints can be avoided. Certain modifications of this arrangement can be introduced, especially when greater stability of the lower denture is desired or when there is little freeway space in the retromolar region. When the articular

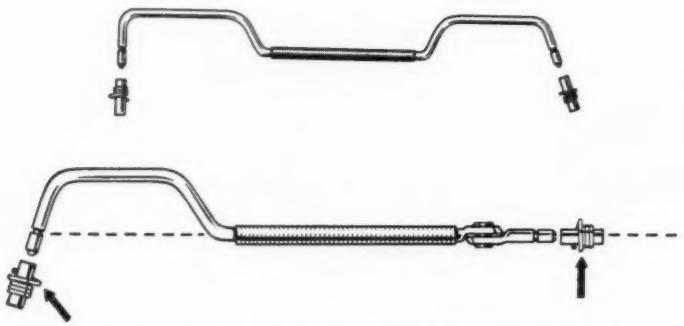

Figure 2 Articular spring bow. Above, double bow; below, single bow

spring bows are attached to the denture, any desired plane or modified curve of occlusion can be utilized.

After routine testing of the stability, both dentures are placed in position, and the patient is asked to move the lower jaw gently in centric relation, and to repeat the opening and closing movements several times, finishing with the teeth in centric occlusion. The next step is testing the stability and retention of the inserted dentures under conditions of extreme functional stresses. The primary requisite is a balanced articulation requiring a careful registration of the positional relations between the jaws, the denture and the articular spring bows.

It should be kept in mind, however, that the manipulative skill—even if combined with diagnostic ability—may enable an operator to construct complete dentures with spring bow attachments in full compliance with all esthetic and biomechanical requirements but that the denture service rendered will not suffice unless full cooperation of the patient is obtained. Oral hygiene must be emphasized, and whenever possible, the dentures should be removed after each meal and rinsed thoroughly. Calculus may be formed on the lingual surface of the denture or the attachment. These deposits should be removed carefully and periodically. Whenever staining occurs, usually caused by smoking, commercial cleansers can be used without damage to denture or attachment.

It is important to emphasize to the patient that a difficult trial period is anticipated. Success in denture service depends on encouraging the patient to overcome patiently the initial hurdles. It depends also on the manner in which the operator is able to organize his efforts and to follow a systematic routine in all procedures of complete denture construction; namely, examination, diagnosis, prognosis, treatment planning, impression taking, base material selection, tooth selection, making of casts, tooth alignment, constructing of denture and retention attachment. In addition, instructing the patient on the use and maintenance of the inserted dentures, and follow-up examinations leading to correction and repair of the dentures if indicated, are important.

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Transferring a prosthodontic restoration between two Hanau articulators

Joseph J. Barone and Julian B. Woelfel.
U. S. Armed Forces M.J. 10:1445-1448 Dec. 1959

A described method of transferring a complete denture from one Model H Hanau articulator to another is limited to the fabrication of upper and lower complete dentures, but may be applicable readily to other types of prosthesis. The method involves the use of two Model H Hanau articulators, one located at the [armed services'] dental clinic, the other at the central dental laboratory. The two articulators should be identified and reserved for one patient but not necessarily left idle when unoccupied by his dentures.

At the dental clinic, the master casts are poured in gypsum, and the occlusion rims formed and adjusted in the mouth for the correct vertical dimension of occlusion. Then, by means

of a face-bow registration and transfer, the upper cast is mounted on the clinic articulator. The incisal guide pin should be flush with the top of the articulator for this mounting. A centric interocclusal record is obtained from the patient. The lower cast is keyed, lubricated and mounted on the clinic articulator. The centric interocclusal record is preserved for later use by the dental laboratory.

The lower cast is separated from its keyed plaster mounting. This plaster lower mounting will be labeled and retained at the dental clinic to serve as a record of the original articulator mounting.

The first shipment to the central dental laboratory includes: (1) the upper cast attached to its mounting ring and the upper occlusion rim, (2) the lower cast and occlusion rim, (3) the centric interocclusal record (which may be attached to either occlusion rim), and (4) instructions regarding shade, mold and type of teeth to be used, together with rim markings and special notations.

At the dental laboratory, the upper cast on its mounting ring is secured to the laboratory's Model H Hanau articulator. The incisal guide pin is set flush with the upper arm of this articulator in order to minimize any errors in adjusting the condylar settings. The original centric interocclusal record received from the dental clinic is used, and the lower cast is mounted on the laboratory articulator. The technician positions the anterior teeth according to the labial contour of the occlusion rims, and sets the posterior teeth into positive centric occlusion for try-in. The lower cast then is removed from the plaster mounting and returned to the dental clinic along with the upper ring and cast and the trial dentures. The plaster lower mounting and ring are identified and retained by the laboratory.

At the dental clinic, at the appointment for try-in, the dentist will take one of the following two steps:

1. If the original articular mounting is correct and the esthetic arrangement of the anterior teeth is satisfactory, the dentist obtains a protrusive interocclusal record and adjusts the condylar elements on the articulator. The condylar settings obtained are recorded on the upper cast and also on the appropriate patient record for later use on the laboratory articulator. Direct transfer of the condylar settings is suggested because the differences that would occur from properly transferring the same condylar settings between the two articulators can be minimal and corrections made when the dentures are inserted. The trial dentures without the lower mounting ring now are returned to the laboratory with instructions relating to the fabrication of the completed dentures.

2. If the original articulator mounting is incorrect, the dentist obtains a new centric interocclusal record at the desired occluding vertical dimension. Then he removes the lower cast on the articulator, verifies the new mounting, and completes the esthetic arrangement of the anterior teeth. A protrusive interocclusal record is obtained and adjusted on the articulator. The condylar settings are recorded on the upper cast and on the patient's record. A transferable centric interocclusal record (with lower posterior teeth removed) is obtained on the articulator for laboratory use. The trial dentures, the upper cast and mounting, the lower cast and the transferable interocclusal centric record now are returned to the laboratory along with the special notification of the new mounting.

If the second step is followed, at the laboratory a new lower mounting is made, using the corrected centric interocclusal record. But if the first step is followed, the laboratory uses its original retained lower mounting to complete the dentures.

The prescribed protrusive readings are used, the necessary settings are made on the laboratory articulator, and the posterior teeth are arranged for balanced occlusion under supervision of the central dental laboratory officer. The dentures then are waxed up, invested, processed and polished. Corrections for occlusal processing errors are made on the laboratory articulator before finishing and polishing.

The finished dentures are returned to the dental clinic with an index or single upper mounting which is made after correcting the processing error. This facilitates mounting the dentures at the time of insertion.

Any dentist familiar with the Model H Hanau articulator can easily adopt this technic.

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Oral surgery

The polyethylene specimen bag as an ice bag in cold therapy

Robert T. Reese. *M.Technicians Bul.* 10:205-208 Sept.-Oct. 1959

The use of cold application therapy after surgical procedures, and for other dental or medical ailments, always has had wide approval.

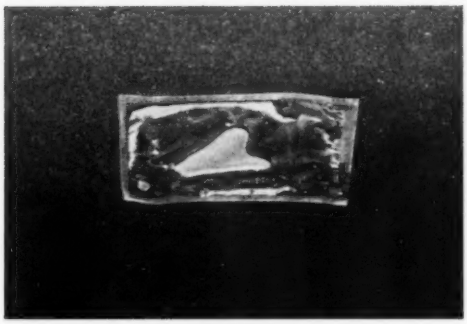
The oral surgery clinic at Hickam Air Force Base, Hawaii, has developed an ice bag that can be filled once and used time after time without leakage. The bags are so inexpensive that they are given to patients to keep and use postoperatively. The cold therapy instructions are for 20-minute application periods for three or four sessions postoperatively. At the end of each 20-minute period, the bag may be placed in the freezer compartment of a refrigerator until its contents are refrozen. Refreezing is achieved within one hour. The ease of handling of the ice bag, and the elimination of ice cube trays or crushed ice assure the oral surgeon or practitioner that his directions for the use of cold therapy will be followed. A series of the ice bags in a freezing compartment will not freeze together.

Experimentation showed that the ideal content of the bag is a 10 per cent solution of sodium chloride. The container used is listed as bag, cellophane, pathological specimen, polyethylene lined, 6 by 8 inches, laminated.

The polyethylene disposable bag is a standard item and costs two cents. The bag should be filled to a fourth of capacity to allow for expansion. The method of sealing the bag is a matter of choice. An alcohol lamp and an ordinary wax spatula will do the job effectively.

The illustration shows the bag one quarter filled with solution, sealed, and ready for the freezing compartment.

To eliminate irritation of tissues by direct contact with cold, and to absorb moisture condensing on the surface of the bag, one or two layers of paper napkins or facial tissue paper should be wrapped around the bag.



Sealed plastic container ready for freezing

The consistency of the ice is such that the ice bag can be applied to any part of the body readily, with the least amount of discomfort for the patient. The flat shape and flexibility of the bag permit it to be incorporated in the last wrap of a bandage or taped to an area, and make it easy for the patient to handle the bag himself.

U.S. Air Force Dispensary, Hickam Air Force Base, Hawaii

New onlay-inlay metal splint for the immobilization of mandibular fractures

Marsh Robinson. *Plast.& Reconstr.Surg.* 25:77-79 Jan. 1960

A new"L" plate, about 1.5 mm. on the short side and made in various lengths from 12 to 24 mm., has been used to immobilize mandibular fractures in more than 140 patients.

A no. 701 fissure bur is used to make a groove just through the cortical plate perpendicular to the fracture (Fig. 1) and long enough to accommodate the "L" plate, an onlay-inlay metal splint.

The onlay portion of the "L" plate is perforated with from four to eight holes, so that alternate holes may be used for screws. Two screws are inserted, one in each mandibular fragment (Fig. 2). The inlay portion of the "L" plate resists the muscle pull and immobilizes the fracture. The onlay portion keeps the inlay portion in position. The screws receive no stress. In fractures of the con-

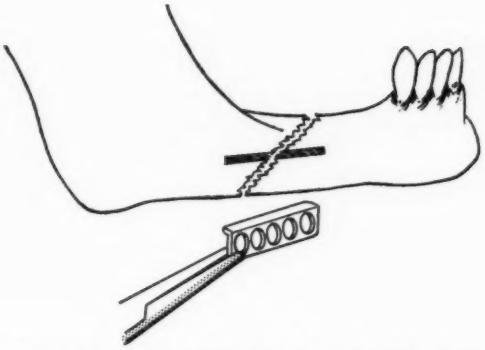


Figure 1 Schematic drawing of a reduced fracture with a groove made through the lateral cortical plate to receive a small, right-angled flange of the "L" plate. A mosquito hemostat holds the stainless steel plate by the flat onlay part

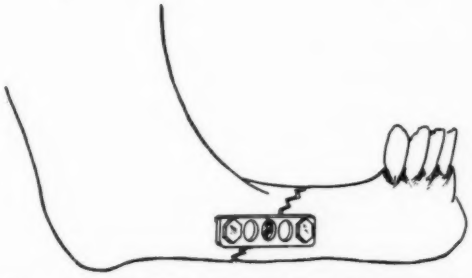


Figure 2 Schematic drawing of the plate (enlarged) fitted in the groove and fixed in place with two stainless steel screws

dyle, angle and body, a flat type of "L" plate can be used, whereas in the cuspid and symphysial area a curved type is needed.

The "L" plate and screws are made of no. 316 stainless steel. The plates can be placed without elevating the periosteum from the lingual surface. Only two small screws need be used.

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Ostamer: a preliminary report

Jose E. Munoz. *J.Florida D.Soc.* 30:2:18-19 Aug. 1959

Ostamer is a polyurethane foam designed as a bonding agent for bone. Qualities include strength, adhesiveness, torsional stability, ease of handling and use, and nontoxicity. The porous nature of the hardened plastic resembles cancellous bone; the plastic apparently forms a lacunar system for the endochondral proliferation of new bone. The plastic graft serves as a bridge or framework for the growth and repair of bone, and Ostamer is gradually replaced by new bone. The life span of the plastic is about 18 to 24 months, and its ultimate fate is not clearly understood. Studies are in progress to determine the pathways of absorption and excretion of this compound.

The plastic hardens and produces sufficient fixation of the fracture in 20 to 30 minutes, after which the wound may be closed. Complete hardening takes from 24 to 48 hours. During this period the plastic is somewhat brittle, and the repaired part should be immobilized. Weight bearing usually can be permitted on the third postoperative day.

Although early investigations with the plastic were confined to its use in long bone fractures requiring open reduction, it also may be used in simple fractures where weight bearing and early ambulation are important from an economic or vocational standpoint.

Ostamer has the following potential uses in dentistry: (1) to fill any defect in bone or to stabilize any osseous lesion, where adequate surgical exposure with good hemostasis can be obtained; (2) to fill and mold flat, atrophied alveolar ridges; (3) to obtain open reduction of mandibular fractures, with chrome-cobalt rods, obviating the necessity of wiring; (4) to repair extensive bone defects caused by cysts.

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Evaluation of radical neck dissections and jaw resections

John C. Gaisford, Dwight C. Hanna, Robert B. Atwell and John L. Terry. *Plast.& Reconstr.Surg.* 25:39-44 Jan. 1960

This paper is an evaluation of 289 complete radical neck dissections and 146 mandibular resections performed from 1950 to 1959. All of the 289 radical neck dissections were done for malignant or suspected malignant tumors. Of the 146 mandibular resections, 106 were done for malignant growths, 38 for osteoradionecrosis and 2 for

benign tumors. In 95 patients the primary tumors were found in the tongue; other sites were the floor of the mouth, 66; lip, 39, and the alveolus, 39. The remaining growths were found in 19 other anatomic sites.

Of the 332 patients, 136 had received surgery or roentgenotherapy before being accepted for treatment by the authors; 196 had clinical spread of disease to the cervical lymph nodes. There were nine surgical deaths.

The following conclusions have been drawn from the authors' work with these patients:

1. Cancer of the mouth and neck is primarily a surgical problem. Though some lesions of the region may be cured by roentgenotherapy, this form of therapy should be used for those patients who cannot be treated surgically, and for patients with primary tumors of the nasopharynx, tonsil and soft palate.

2. Radical surgery and radical repair of the surgically created defects go hand-in-hand. The plastic surgeon can do both if adequately trained in general surgery and his own specialty. This is not an operation to be performed only by surgical specialists.

3. Reparative surgery should be prompt and complete. This concept represents a change from earlier thoughts, where it was felt months should pass to determine the possible cure status of the patient. The patient probably has but one chance of recovery, and therefore reconstruction must be prompt.

4. Immediate replacement by an autogenous bone graft after jaw resection offers the most ideal restoration, but can be performed only in selected patients because of insufficient soft tissue coverage at the time of excision. If the fragments of the resected jaw can be held in their original relative positions, the patient usually is comfortable and the esthetic effect often is satisfactory. Best results with the least morbidity have been obtained by using an extraoral fixation (Roger-Anderson) appliance and allowing it to remain in place for six weeks. Foreign-body replacements in the mouth are not tolerated well and usually are not functional.

5. The responsibility of the surgeon goes beyond the successful removal of the malignant tumor and requires the use of skin grafts, pedicle flaps and bone grafts in an effort to restore the patient to as near a normal state of existence as possible. This will allow the patient to resume a normal place in society with comfort, good health and security.

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A foreign body simulating a tumor of the parotid gland

David C. Wherry and J. Gordon Lee.
Plast.& Reconstr.Surg. 25:59-61 Jan. 1960

A 42 year old Negro man was admitted to the hospital because of a swelling in the region of the left parotid gland, of four months' duration. Ten months before admission, he had received a blow to the left zygomatic area of the face with a billiard stick and sustained a superficial laceration. The laceration was untreated and healed primarily within two weeks. Four months prior to admission, the patient had noted a mass in the left parotid region which became progressively larger. The mass was asymptomatic except for occasional pain. The patient had no evidence of facial nerve weakness, but there was trismus. Several well-circumscribed, nontender nodes were noted at the angle of the mandible.

A roentgenogram of the left side of the face failed to reveal any evidence of a foreign body or radiopaque calculus.

The hospital's tumor board concurred in the diagnosis of a left parotid gland tumor and surgical extirpation was recommended.

At operation, an abscess cavity was opened. On probing, a piece of wood about 3 cm. long and 0.5 cm. wide was encountered and removed. It proved to be the tip of the billiard cue which had entered the parotid gland ten months earlier. Microscopic examination of a portion of the superficial lobe of the parotid gland revealed fibrosis and chronic inflammation. The wound was closed and drained with a Penrose drain. Recovery was uneventful and the patient showed no evidence of facial nerve weakness.

Veterans Administration Hospital, Washington, D.C.

Endodontics

The management of fine root canals

Maurice Buchbinder. *New York J.Den.* 30:9-11,15 Jan. 1960

In endodontic practice, the location, probing and widening of fine canals take up a large part of the operator's time. Such work can be facilitated by use of a lubricant, placed directly into the canal from a needle-tipped plastic squeeze bottle.

The formula of the lubricant is: glycerine, 2 parts by volume; water, 1 part; borax, 5 per cent, and benzalkonium chloride, 1:1,000. The mixture does not irritate the periapical tissue or gingiva.

The outline form for access to the canal is prepared in the crown, and the chamber is flushed before the canal is probed. When the chamber is cleared of debris, it is filled with the lubricating fluid from the squeeze bottle. A Kerr no. 1 short handle file is gently pushed, turned to the apex and then removed. This probing is repeated until the canal is ready for the removal of pulp tissue with the short handle barbed broach. The lubricant creates a sludge with the debris, and the sludge may be removed by wiping the file and flushing the chamber with benzalkonium chloride or sodium hypochlorite 5 per cent. Lubricant is added as needed.

The canal is measured in the usual way, and further instrumentation is guided by the length of the canal. When the Kerr no. 1 file passes smoothly to the apex, the no. 2 file is used, and then the no. 3. The coronal half of the canal may be further widened with the no. 4, no. 5 and even the no. 6 reamer.

The lubricant reduces friction between the instruments and the walls of the canal. The lubricant is noncorrosive to instruments and nonirritating to tissue. Reamers may be rotated freely when the canal is lubricated. Files can be advanced into the canal safely when the canal is lubricated. The lubricant also facilitates the work of debridement.

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Microscopic observations on living dental pulp. IV. The effect of oil of clove and eugenol on the circulation of the pulp in the rat's lower incisor

Mauri Pohto and Arje Scheinin. *Suomen hammaslääk.toim.* 55:185-195 Sept. 1959

Oil of clove or eugenol was applied either directly on the exposed pulp tissue or on a thin dentinal layer over the pulp of the lower incisor in the live rat.

Severe changes occurred rapidly in the exposed pulp when either liquid was applied. Total thrombosis of the entire pulpal circulation developed within a few minutes. Where the opening made through the dentin was in the form of a slit, stasis and thrombosis occurred within a radius of 200 to 400 microns from the site of the perforation.

Where a thin dentinal layer had been left over the pulp, oil of clove or eugenol produced hyperemia as revealed through an increase in the velocity of the blood flow and through capillary dilatation. Aggregates of red and white cells were observed in some instances. In this series, thrombosis developed in only a few instances. The pulpal changes were limited to hyperemia and the formation of cell aggregates when either liquid was used in a paste with zinc oxide.

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Endodontic case management—preliminary report of a study

Shahan A. Adrian. *Tufts D.Outlook* 32:5-9,21 Fall 1959

In the Navy, the patient often is unable to arrange for a series of visits to the dental office. A study was undertaken to determine what the postoperative sequelae would be if a maximum number of patients were provided endodontic treatment in a minimum of clinic time. From

February 1959 to October 1959, 240 teeth were treated endodontically. The average time spent with anterior teeth was one hour; with bicuspids, one and a quarter hours, and with molars, a minimum of one and a half hours. Of the 240 teeth, 180 were anterior teeth, 34 were bicuspids and 26 were molars. Eighty-six teeth (35.8 per cent) had vital pulps, 134 (55.8 per cent) had nonvital pulps, and in 20 teeth (8.3 per cent) the root canal was exposed.

In 173 teeth (72.1 per cent), the endodontic treatment was completed in one visit; in 55 teeth (22.9 per cent), in two visits, and in 12 teeth (5.0 per cent), more than two visits were required.

More treatments might have been completed in one visit except for the fact that the patient load was too great to permit the operator to complete the work in one visit. Acute postoperative infections developed in only three instances.

Treatment of almost all the teeth with vital pulps was completed in one visit. Postoperatively, minor symptoms (sensitivity to percussion, mild toothache in the periapical region, or periapical sensitivity on palpation) developed in 151 (62.9 per cent) of the 240 teeth.

The technic and rationale of treatment are as follows: The main root canal is reamed, flushed, dried and tightly obturated. The lateral and apical accessory canals are sealed with an antiseptic root canal sealer during lateral condensation. With the root canal thus sealed, the only viable microorganisms are left in the periapical tissues. With an asymptomatic tooth, the periapical tissue resistance should be well-organized. With the tooth thus treated and the source of irritation from within the tooth now eliminated, any periapical pathologic lesion must undergo complete healing.

Most of the teeth were sealed with silver points which were fitted so precisely that they were seated with extreme pressure, often malleted to place, after the walls of the root canal had been heavily coated with sealer. Accessory condensation to fit lateral gutta-percha points would force the sealer into any lateral canals or accessory apical canals.

A method of ideal case management in the endodontic treatment of military patients has been worked out. All teeth with vital pulps can be treated in one visit with no risk whatever. Asymptomatic teeth with nonvital pulp and with minor symptoms can be treated in one visit, provided that after treatment a subperiosteal prophylactic drain is inserted (under local anesthesia) and left in place for two or three days.

After treatment of 11 teeth with nonvital pulps, check-up roentgenograms were taken and all showed healing of the periapical tissues in less than six months. Check-up roentgenograms will be obtained of other treated teeth and a report will be prepared.

43 Gould Avenue, Malden, Mass.

In situ therapeutic life span of para-aminotoluene sulfonamide (Benzylog)

Benjamin F. Gurney and E. James Best.
Illinois D.J. 29:11-14 Jan. 1960

Endodontic therapy can be conducted successfully by means of endodontic paper points impregnated with para-aminotoluene sulfonamide (PATS) used in conjunction with an isotonic solution of the same drug (Gurney and others, 1958). A study was made to determine the optimum time to allow between appointments when this drug is used in root canal therapy.

This study was conducted on 271 spent endodontic paper points impregnated with about 4 mg. of PATS, aseptically removed from root canals after various intervals *in situ*. The spent points were placed in inoculated agar plates and the plates incubated at 38°C. for three days, and the zones of inhibition observed.

The probability was found to be less than .50 that a given endodontic dressing will exhibit therapeutic activity after being *in situ* for from five to six days. The probability is greater than .50 that a given dressing will demonstrate antibacterial activity up to four days *in situ*. Therefore, it is suggested that an optimum interval between appointments for patients who are undergoing endodontic treatment with para-aminotoluene sulfonamide be established at about four days.

1757 West Harrison Street, Chicago 12, Ill.

Extractions

'Dry socket' after mandibular odontectomy and use of soluble tetracycline hydrochloride

James F. Quinley, R. Quentin Royer and Robert J. Gores. *Oral Surg.,Oral Med.& Oral Path.* 13:38-42 Jan. 1960

This study was undertaken to test the effectiveness of tetracycline hydrochloride in preventing postoperative osteitis or dry socket after removal of impacted mandibular third molars.

In 367 patients, 522 impacted mandibular third molars were removed. In 510 sockets, 50 mg. or more of tetracycline was placed just prior to closure of the wounds. No tetracycline was placed in 12 sockets; one tablet (50 mg.) was placed in 81 sockets; two tablets were placed in 374 sockets; three tablets were placed in 37 sockets; four tablets were placed in 16 sockets; five tablets were placed in one socket, and six tablets were placed in one socket. The tablets were crushed and broken after placement within the sockets.

Both examination of the socket and the patient's complaints relative to the severity of postoperative pain were used to denote the occurrence of dry socket.

Dry socket developed in 8 of the 522 sockets from which impacted third molars had been removed. The eight dry sockets were found in eight different patients. Four of the dry sockets developed in the 12 patients in whose alveolar sockets no tetracycline tablets were placed (33.3 per cent) and four dry sockets developed in the 510 sockets that had been treated with one or more tablets of tetracycline (0.78 per cent).

Milhon and others (1943) found a rate of incidence of dry socket of 16.8 per cent in a series of 304 extractions in which no medication was used, and a rate of incidence of 2.8 per cent when 60 per cent sulfathiazole in a glycerin base was used in a series of 397 extractions.

Several patients in the present series experienced a foreign-body reaction. The foreign body proved to be unabsorbed tetracycline, manifesting itself after several weeks as a hard, insoluble, black, tarry-looking substance sloughing from the wound. The patients experienced little pain or discomfort as a result of the foreign-body reaction; however, it was annoying and time consuming for both the patient and surgeon.

In the majority of patients, the use of tetracycline has been most satisfactory. However, the disagreeable results that naturally follow if a careless surgical technic is used cannot be avoided merely by the use of chemotherapy or antibiotics.

Mayo Clinic, Rochester, Minn.

Indications for tooth extractions

A. E. M. Aldus. *Nederlands Tandarts.* 14:379 Oct. 1959

P. J. Brekhus reported in 1929 that 96.6 per cent of tooth extractions performed at the dental department of the University of Minnesota were because of the presence of either caries or periodontal disease, whereas the remaining 3.3 per cent were because of tooth impaction, cystic conditions, supernumerary teeth or accidents. He concluded that caries was the major cause of tooth extraction in children and young adults, and periodontal disease (mainly periodontosis) played the main causative part in tooth extractions performed in older patients. Brekhus' findings were based on 13,909 tooth extractions performed in 2,723 patients.

E. F. Allen, who carried out a similar investigation at the University of Michigan School of Dentistry in 1944, came to almost identical conclusions. He reported that of 1,424 teeth extracted from 353 patients, caries was the indicating factor in 48.8 per cent, and periodontal disease (mainly periodontosis) in 40.7. Only 2.8 per cent of extractions were for prosthetic reasons, whereas the remaining 8.5 per cent of extractions were to eliminate impacted or supernumerary teeth.

H. W. Krogh reported in 1958 that at his dental office in Washington, D. C., during one year 7,109 teeth were extracted in 744 men and 1,593

women patients. He demonstrated that approximately 40 per cent of tooth extractions were caused by caries, 20 per cent by periodontal disease and 20 per cent were made for prosthetic reasons. The other approximately 20 per cent were for orthodontic or nonspecific reasons.

In all age groups considered in the investigations of the three researchers, caries was the main factor in the extractions, followed by periodontal disease, whereas prosthetic, orthodontic and other nonspecific reasons played only an insignificant part.

These findings are in complete agreement with those of Dutch investigators who reported that all tooth types were almost equally involved in carious processes requiring extractions, whereas especially the anterior teeth were involved in periodontal disease, or their removal was caused by the necessity of prosthetic procedures.

Prins Hendrikklaan 16, Zeist, The Netherlands

Pathogenesis of dental sinusitis

Harry Björk. *Suomen hammaslääk.toim.* 55:163-171 Sept. 1959

The topographic relations between the maxillary sinus and the alveoli, and the occurrence of caries, are important factors in the etiology of dental sinusitis. The first and second molars are the most common paths of infection. In this study of 88 cases of dental sinusitis, it was observed that in almost 50 per cent of the patients the infection had traveled via the first molar. However, in this series infections developed from all maxillary teeth.

In 48 of the 88 patients (55 per cent), sinusitis had developed by spontaneous extension of the infection into the maxillary sinus; in 47 patients, the sinusitis was a result of pulpitis, and in 1 patient, of periodontal disease. In 40 patients (45 per cent) sinusitis appeared subsequent to a dental treatment—in 37 patients after extraction and in 3 patients after endodontic treatment.

If, in connection with tooth extraction, a large opening arises into the sinus, the alveolus should be closed without loss of time to preclude the development of sinusitis. A small opening generally closes spontaneously, if improper measures (such as packing, probing, use of a caustic agent or irrigation through the alveolus) are avoided. A small fragment of root or bone often will disappear spontaneously from the maxillary sinus. A larger fragment of root or bone must be removed through an opening made in the canine fossa.

Opening of an alveolus and entrance of a fragment into the sinus in connection with tooth extraction generally is the result of unfavorable anatomic factors. A frank explanation should be given the patient of what has occurred in order that the sinusitis may receive prompt treatment.

Laivurinrinne 1 A, Helsinki, Finland

Diagnosis and treatment of hemophilia

B. A. Waaler. *Tskr.norske laegefor.* 79:1111-1118 Oct. 1, 1959

Estimation of whole blood clotting time is an insensitive test of the function of intrinsic blood coagulation, with many sources of error. If the test indicates a prolonged coagulation time, the information is valuable for diagnosis and treatment. If the test does not indicate a prolonged coagulation time, however, the presence of hemophilia cannot be ruled out.

Estimation of secondary bleeding time is a better test than that of the whole blood clotting time. Hemophilia can occur in a mild form. The key to the diagnosis of a mild hemophilia lies in the patient's history. Special attention should be paid to the bleeding tendency after tooth extractions, surface injuries or minor surgical interventions.

If blood transfusions are to be given to hemophiliac patients in whom hemorrhage has occurred, the quantity of blood, plasma or concentrated preparation should be sufficient to raise the level of the antihemophilic factor in the patient's plasma to from 15 to 20 per cent of the normal value. In most instances, the effect of the blood transfusion will end quickly and is almost completely eliminated after 24 hours.

Inkognitogt 26/2, Oslo, Norway

Pedodontics

Sex-linked differences in tooth eruption

Peter Adler. *Deut.Zahn Mund Kieferhk.* 31:20-33 Aug.-Dec. 1959

During the last decade (1949 to 1959), 521 reports have appeared in the international dental literature which dealt with the eruption time of permanent teeth in school children of 40 different nationalities. The results of 494 investigations indicated an earlier complete eruption of permanent teeth in girls than in boys, whereas only 27 investigators observed an earlier complete eruption of permanent teeth in boys. The greatest difference, observed by all authors, appeared to be in the eruption of the lower permanent cuspids.

The results of 114 comparative examinations of the number of completely erupted permanent teeth at an identical chronologic age, carried out in school children of 15 different nationalities, revealed that 110 investigators had observed a greater number of completely erupted permanent teeth in girls than in boys, whereas only four investigators claimed that they observed a greater number of completely erupted permanent teeth in boys.

The results of 39 comparative investigations of the time elapsing between the eruption of deciduous teeth and that of the permanent teeth showed that 30 investigators have found a longer eruption interval in boys, and nine observed a longer eruption interval in girls.

During an investigation of the comparatively low incidence of caries in the deciduous dentition of Hungarian school children, between 6½ and 8½ years old, the sex-linked difference in tooth eruption became evident. However, only the first two conclusions drawn in the previous reports could be confirmed, but not the third.

In 28 comparative investigations of the period elapsing between the eruption of the deciduous teeth and that of the permanent teeth in these Hungarian school children, 16 comparisons (made in pairs) showed a statistically significant, sex-linked difference in the tooth eruption time. The greatest observed difference appeared to be in the eruption period of the upper and lower cuspids; this difference was far greater than that observed in the eruption period of bicuspids and second molars.

The determined selective and sex-linked difference in the eruption of cuspids can hardly be explained by specific "secondary sex characteristics" of cuspids.

The period of time elapsing between the eruption of the deciduous teeth and that of the permanent teeth is approximately the same in boys and girls.

The sex-linked difference in the eruption of the permanent teeth, however,—if accurately evaluated—may prove to be important for the services to be rendered by the school dental clinics, especially for dental treatment required for children entering the elementary schools.

Dental School of the University of Debrecen, Debrecen 12, Hungary

Calcification time of permanent teeth in relation to chronological and skeletal age in children

R. Hotz, G. Boulanger and H. Weisshaupt. *Helv.odont.acta* 3:4-9 April 1959

Dental and carpal roentgenograms were made on 298 healthy children of Zurich, Switzerland, 6 to 11 years old. Eleven arbitrarily selected stages of intra-alveolar maturation of all types of teeth were used as criteria of dental age.

When the skeletal ages of hand bones of the Swiss children were compared with data obtained on children in the United States by Greulich and Pyle (1950), a retardation in bone maturation of three to four months was found in the Swiss children.

The intra-alveolar calcification of homologous teeth was found to be symmetrical for most types of teeth. Asymmetry was most pronounced for the mandibular second bicuspid, least pronounced for the mandibular first molar.

Maxillary teeth, when compared with mandi-

bular teeth, generally were retarded in roentgenographic dental age, except for the first molar. Dental development in girls generally preceded that in boys by an average of four to five months.

Among all teeth studied, the mandibular first bicuspid and the maxillary lateral incisor showed the highest degree of correlation between dental and chronological age and between dental and skeletal age.

Dental Institute, University of Zurich, Zurich, Switzerland

The effect of antisialogogues on children

W. Neal Newton and Richard D. Morrison. *J.Den.Children* 26:347-350 Dec. 1959

Sialism is a major problem in dentistry for children. This study was undertaken to evaluate the effectiveness of four potential agents in reducing saliva volume in clinical situations. The subjects were 29 normal children between the ages of 8 and 12 years old. Each child was available for four consecutive two-hour appointments scheduled at the same time of day at intervals of one week. A calibrated 10 ml. vial was introduced into a conventional saliva ejector to allow quantitative recovery of all saliva entering this system during the test periods. Five-minute saliva volumes were gathered at 30-minute intervals and compared statistically.

The four compounds tested, utilized in their usual therapeutic doses, were: atropine sulfate, 0.3 mg.; scopolamine hydrobromide, 0.3 mg.; promethazine hydrochloride, 12.5 mg., and methantheline bromide. Two placebos, cornstarch and lactose, were used, and a repeated blind test pattern was utilized. The following results were observed:

1. Methantheline bromide exhibited the most rapid onset, and was most effective in depressing the volume of saliva.

2. Scopolamine hydrobromide depressed salivation significantly only 90 minutes after medication, but the results indicated it could produce the greatest reduction in salivation with a longer test period.

3. Atropine sulfate in the usual dose did not effectively diminish saliva volume during dental procedures with children.

4. Further evaluation of both scopolamine hydrobromide and methantheline bromide to determine their usefulness as adjuncts in pedodontic practice is indicated.

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Early permanent molar loss and dental caries

Sidney B. Finn. *J.Den.Children* 26:351-354 Dec. 1959

This study was designed to determine whether the extraction of the first permanent molar would affect the incidence of dental caries in the quadrant from which the molar was missing, as compared to the caries incidence in the opposite quadrant where the first permanent molar was present.

The subjects consisted of 192 children averaging 16 years old, residing at the Alabama School for the Deaf and Blind. In these children there were 229 quadrants in which the first permanent molar had been extracted unilaterally.

In the quadrants from which the first permanent molars had been extracted were 188 DMF surfaces on the bicuspids and the distal surface of the cuspid. In the opposite quadrants in the same arches were 304 DMF surfaces in the corresponding teeth. Eighty-five quadrants were not considered in this study because no proximal caries were found on the surfaces being evaluated in either quadrant.

Of the 144 quadrants evaluated, 28 had more DMF surfaces on the side from which the first molar was missing, and 31 had the same number of DMF surfaces as found in the opposite quadrants.

The findings are in agreement with those obtained by Lind (1954), who observed a reduction in dental caries in specific teeth after loss of the first permanent molar among 13 children observed for nine years. This study indicates that the dentist should consider removing the first permanent molar as soon as its permanence becomes doubtful, to allow for a better alignment of the second permanent molar and to prevent dental caries.

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Orthodontics

Early orthodontic treatment of pctients with cleft lip, cleft jaw or cleft palate: the McNeil method

R. Hotz and B. Graf-Pinthus. *Schweiz.Mschr. Zahnhk.* 70:1-9 Jan. 1960

The surgical repair of cleft lip, cleft jaw or cleft palate still is, in spite of the many recently developed operative improvements, often prognostically unfavorable. If performed at too early a time, the surgical closure of the cleft may impair the maxillary growth, mainly by extreme tissue tension. In many patients with cleft palate, postoperative pseudoprognathism and anterior or lateral cross-bite develop, sometimes even before the shedding of the deciduous incisors.

In 1954, Kerr McNeil published his report on the results of early orthodontic treatment of children with cleft lip, cleft jaw or cleft palate. This work aroused a storm of controversy, both in the field of orthodontics and in that of oral (plastic) surgery. The focal point in this conflict was—and still is—whether or not the union of clefts can be secured by nonsurgical procedures. However, the less spectacular, although more important, aspect of McNeil's method, that is, the resulting preoperative correction of the defect of the maxillary arch and the satisfactory relationship between the arches, were entirely overlooked.

The McNeil method involves the beginning of the orthodontic treatment of patients with cleft palates as soon after birth as possible. Clinical experience has demonstrated that in instances of comparatively mild cleft conditions the initial orthodontic procedures may be delayed up to six weeks of age, but generally, the guiding principle should be "the earlier the better."

The technical procedure consists in fitting the patient with a palatal plate which simultaneously acts as an obturator and as an orthodontic appliance.

After a composition impression is taken of the upper dental arch, the plaster model is prepared. The extent of the defect and the relations between the jaws are analysed and embryologic and morphologic factors are taken into consideration.

Based on the analysis, the decision as to what corrective procedures are required is made, that is, whether lesser segments need moving forward or outward or whether a midline correction of the major segment is indicated.

The model is then cut at the appropriate places and the segments moved in the required direction, after which the model is rebased. The amount of orthodontic correction applied at a given time is a matter of clinical judgment, but is, of course, related to the rate of growth of the child. The first plate, therefore, serves mainly as a feeding plate to accustom the infant to wearing an orthodontic appliance. Increasing correction may be applied when the child has passed the neonatal period and has entered the period of rapid growth.

At that time, a bite-block is made of soft carding wax and transposed to the corrected working model. The infant's bite has to be registered in a slightly gagged position. The center line of the skull is recorded in the wax—this procedure is of great help in trimming the model and in assessing the deviations of the segments.

A simple acrylic plate then is made on the properly corrected model. Inserted, it is the action of biting the plate that achieves the desired moulding and stimulation of the maxillary process.

The response to an early orthodontic treatment of children with cleft lip, cleft palate or cleft jaw, observed at the orthodontic department of the Dental Institute of the University of Zurich, was most favorable, especially in bringing forward the underdeveloped segments and in correcting lateral deviations by a process of controlled collapse and moulding of the involved segments of the maxillary arch.

After the preoperative treatment, the cleft lip can be repaired surgically without the risk of postoperative complication, and cleft jaw or cleft palate can be closed by bone stimulation. In all instances, the orthodontic appliance should be reinstated as soon as possible.

To achieve satisfactory results, cooperation between orthodontist, oral surgeon and phoniatrician is essential.

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Obtundent effect of vibration

Frederick W. Spaulding. *Am.J.Orthodont.* 45:917-923 Dec. 1959

The effect of vibration in lessening the pain of appliance activation was first noticed in connection with the use of heatless stones in smoothing arch and tie wires immediately after their adjustment. These observations prompted the use of an instrument which could provide an easily controlled vibratory force. A mechanical obtundent to combat (locally) pain that is mechanically produced is logically preferable to use of a systemic analgesic. A clinical study was initiated to record the effect on patients of vibration induced with various appliances.

A reasonably quiet and gentle dental vibrator was employed to transmit the 60 cycle vibration directly to the metallic appliance or to the tooth. The stimulator tip of rubber was cut down to its base.

The obtundent effect of vibration was studied in 30 patients selected at random.

To the question, How does it feel? 20 patients (66.7 per cent) said the vibrator helped; three (10 per cent) were apathetic, and one (3.3 per cent) said that it gave no help.

To the question, Do you want more? 6 patients (20 per cent) said they did, and 24 (80 per cent) said they did not.

Facial signs indicated relief in 20 patients (66.7 per cent) and no relief in 10 (33.3 per cent). Unsolicited comments expressing relief were made by 12 patients (40 per cent). One patient (3.3 per cent) made an unsolicited comment expressing no relief.

Tolerance to permit proper degrees of adjustment was increased sufficiently in 14 patients (46.7 per cent) but not increased in 16 patients (53.3 per cent).

The most comfortable pressure was estimated to be between 1 and 3 ounces. Fourteen of the 30 patients applied the vibrator themselves. The most effective direction from which to apply the force is against that of the active orthodontic appliance.

The study suggests that a controlled vibratory force applied to teeth under newly applied orthodontic appliance force often will relieve the accompanying acute discomfort.

No patients were completely relieved of discomfort by the vibratory technic.

433 Main Street, Manchester, Conn.

A longitudinal study of occlusion and tooth eruption in relation to skeletal maturation

Jagdish K. Bambha and Pearl Van Natta. *Am.J.Orthodont.* 45:847-855 Nov. 1959

The incentive for this investigation of the relationship between malocclusion and skeletal maturation is a statement (1958) by Krogman: "There is reason to believe that a higher rate of malocclusion and more severe cases (Class II, Division 1, for example) are to be found in maturational laggards." If skeletal age minus chronological age is negative, the difference is termed a skeletal lag; if positive, a skeletal gain.

The subjects were 28 boys and 32 girls enrolled in the Child Research Council, Denver. The present study was restricted to the period between the ages of 3 and 16 years for each child. The hand and wrist roentgenograms were considered for the period from 3 to 13 years, and the dental casts for the period from 12 to 16 years. Analysis of the longitudinally accumulated data on the 60 children led to the following conclusions:

1. There is no evidence of higher rates of malocclusion in maturational laggards.

2. There is no evidence of more severe malocclusion in maturational laggards.

3. There is no evidence of association between time of tooth eruption and time of skeletal maturation, or between time of tooth eruption and severity of malocclusion.

University of Colorado School of Medicine, Denver, Colo.

Periodontics

A comparative study of saline packs and astringent packs in reducing the depth of periodontal pockets

James L. Padgett. *Northwest.Univ.Bul.* 60:4:4-11 Fall 1959

In the treatment of 28 patients with edematous hyperplastic gingivitis, a study was made to compare the action of an astringent pack consisting of cotton twists saturated in 8 per cent solution of zinc chloride with that of a saline pack consisting of cotton twists saturated in sterile physiologic saline solution. The experiment was confined to the anterior region of the upper and lower dental arches. After the teeth were scaled, the astringent pack was placed in the periodontal pockets of the right side of the upper and lower arches for 20 minutes, and the saline pack was placed in the periodontal pockets of the left side of the arches for 20 minutes. The following observations were made:

1. Both scaling and application of packs played a part in reducing the depth of the periodontal pockets.

2. A single scaling was more effective in causing an apical shift in the crest of the gingival margin of shallow pockets than of deeper pockets in the same relative region.

3. A series of treatments using either saline or astringent packs resulted in a greater apical shift of the crest of the gingival margin in moderately deep periodontal pockets than in more shallow pockets in the same region.

4. The astringent pack was slightly more effective than the saline pack in causing an apical shift in the crest of the gingival margin.

5. Scaling and packing procedures tended to cause a slight coronal shift in the bottom of shallow pockets where access to the pocket was favorable.

6. Scaling and packing procedures resulted in a slight apical shift of the bottom of the pocket in deep pockets where access was not favorable.

7. Pockets which showed a coronal shift in the bottom of the pocket also showed an apical shift in the crest of the gingival margin.

8. Those periodontal pockets which were deepened by an apical shift in the bottom of the pocket also showed an adequate apical shift of the crest of the gingival margin to compensate for the unfavorable change in location of the bottom of the pocket.

9. Roentgenographic evidence of change in the location of the bottom of the pocket after five weeks of treatment could not be evaluated easily.

311 East Chicago Avenue, Chicago, Ill.

Is periodontal trauma a primary exciting factor in chronic periodontal disease?

Max Gratzinger. *Rev.Belge Sci.dent.* 14:485-493 Sept.-Dec. 1959

The history of the phenomenon "periodontal trauma" is one of the most interesting chapters in dental science. Suggestions that the loosening of teeth may be caused by damaging occlusal forces were recorded in early dental literature.

Three decades ago, P. R. Stillman and J. O. McCall introduced the clinical picture of "traumatic occlusion." H. K. Box later presented his theory of "traumatogenic occlusion." He described two different types of chronic periodontal disease: (1) periodontitis simplex and (2) periodontitis complex. Periodontitis simplex occurs as a consequence of the accumulation of calculus and similar irritating matter at the gingival margin, whereas periodontitis complex is caused by a traumatogenic occlusion which produces a specific pathologic condition. This condition was termed "pericementitis fibrosa" by Box because of the characteristic histopathologic changes observed in the periodontal membrane.

Balint Orban and J. P. Weinmann described the pathogenesis of periodontosis almost identically as Box did the pathogenesis of periodontitis simplex. Karl Häupl and Franz Josef Lang, however, pointed out that the degenerative changes

in the periodontal membrane and osseous tissue are inflammatory responses to the functional abuse of these tissues and not a symptom of degeneration.

The theories of "traumatic occlusion" and "traumatogenic occlusion" aroused tremendous opposition, and after many years of highly controversial discussions "periodontal trauma" was recognized as a complicating but not as a primary exciting factor in the pathogenesis of chronic periodontal disease.

The phenomenon of periodontal trauma is now defined as the result of the lateral component of a force which exceeds the physiologic resistance and adaptive capacity of the periodontal tissues.

Investigations of the development and physiologic functions of the masticatory system in regard to eruption, retention, compensation and adjustment reveal that every failure in one or more of these phases can lead to the introduction of the damaging force.

There are four types of causative factors which produce "dynamic irritation" (the term suggested by the author) of periodontal tissues: (1) individual malocclusion; (2) initial contact in the incisor region; (3) bruxism, and (4) imbalance between intraoral and extraoral retentive musculature.

The elimination of the dynamic irritation, obtained in a series of periodontal treatments, seems to indicate that periodontal trauma should be considered as a primary exciting factor in chronic periodontal disease.

25 East Washington Street, Chicago 2, Ill.

Periodontics and gerodontics

Ch. Böhne. *Zahnärztl.Praxis* 10:202
Sept. 1, 1959

The problem of dental treatment of the aging and aged patients has become more and more significant, not only because dentists are now aware of the dental aspects of senescence and senility such as changes in dental tissues produced by age, but because of the health procedures which have promoted an increased general longevity.

The changes in the periodontal tissues associated with aging usually are caused by the following:

1. Functional attrition which produces broader masticatory surfaces and an extremely decreased resistance to periodontal disease.

2. Physiologic reduction of the alveolar process which produces an increased length of the teeth simultaneously with a decreased length of the roots, resulting in weakening of the resistance to masticatory stresses and thereby to periodontal disease.

3. Physiologic reduction in the quantity, and chemical changes in the quality, of the saliva, resulting from change in the dietary habits and in an increased accumulation of calculus.

4. Metabolic changes resulting in the intensification of the degenerative process in the entire aging organism and especially in the investing and supporting tissues surrounding the teeth.

5. Tooth losses which affect adversely the intake of food and accentuate degenerative diseases in various parts of the body which may affect the periodontal membrane, the gingiva and the alveolar process.

6. Disturbances in the function of the temporomandibular joint produced by multiple tooth losses.

To emphasize the relationship between periodontics and gerodontics, an intensive educational program should be initiated to explain to the general public the importance of an early recognition of periodontal symptoms in aging persons. Such an educational program, however, will be of little value unless the senescent persons themselves have become aware that preventive and therapeutic procedures are available and that successful periodontal treatment should be initiated as early as possible.

With such an educational program initiated, the incidence of periodontal disease in senescent patients can be significantly reduced.

(13b) München-Gräfelfing, Germany

Case reports

Cleidocranial dysostosis: report of case

Helena Laniejew. *Czas.stomat.* 12:779-783 Nov. 1959

Cleidocranial dysostosis is an extremely rare congenital disease which is characterized by complete absence of or defects in the clavicles, delayed closure of the fontanelles, broad face and skull, protruding facial bones, short stature, delayed eruption or noneruption of teeth and presence of supernumerary teeth.

A 16 year old Polish girl with cleidocranial dysostosis was observed at the Prosthodontic Clinic of the Dental School of the University of Lódź, Poland.

The patient's history revealed that her deciduous teeth did not erupt before her sixth year. The occlusion began in a normal mesiodistal relationship but a deep bite developed. Extreme attrition changed the intermaxillary relations and produced a mesioclusion which became obvious at her ninth year. Roentgenograms, taken when she was six years old, showed no supernumerary teeth. Later, two supernumerary teeth appeared in the upper incisor region and two in the lower bicuspid region. The crowns of the erupted teeth showed defective enamel surfaces, and the roots were bent. The upper jaw was retruded and the teeth were crowded.

Histopathologic examinations showed that the changes in the osseous tissues were mainly of a sclerotic nature. Haversian systems were observed in the compact bones but were significantly altered so that the incremental growth lines were reduced in number and widely separated. In the bones involved, cementing substances were absent. The narrowed marrow spaces were fibrotic and exhibited a minimal vascularity. Osteogenesis apparently proceeded but showed signs of a significant disturbance in the matrix material which appeared coarse and granular. Calcification occurred at an accelerated rate.

Because no satisfactory treatment for cleidocranial dysostosis exists, procedures at the clinic were limited to insertion of partial dentures after the supernumerary teeth, and teeth showing dilated follicles or cyst formation, were extracted. After the patient wore her partial dentures for more than a year, a satisfactory occlusion developed although no attempt was made to stimulate tooth eruption therapeutically.

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Mouth breathing

Zahnärztl.Praxis 10:141 June 15, 1959

Q.—The patient, a 65 year old man, complained about the following conditions which had occurred increasingly for six years: (1) dryness of the mouth; (2) unpleasant taste associated with halitosis, and (3) inflammation of the tongue, which becomes dark red and "as hard as wood." These symptoms occur during the night and disappear after ten minutes and are accompanied by extreme headache and fatigue. For 12 years, the patient suffered from asthma. What suggestions can be made in regard to diagnosis and treatment?

A.—The patient probably is a mouth breather because of either failure of the oropharyngeal muscles, or nasal obstruction caused by allergic rhinitis and polyposis. No specific morphologic type, however, is associated with habitual mouth breathing, which causes dryness of the oral cavity and inflammation of the tongue. In this patient, mouth breathing probably changes to nose breathing after awakening, and increased salivation produces disappearance of the symptoms in about ten minutes. In the management of a habitual mouth breather the first step is to search for any obvious and definite causes of nasal obstruction by examination by an otorhinolaryngologist. Treatment consists of elimination of the allergic rhinitis and polyposis. Improvement can be obtained by topical administration of naphazoline hydrochloride before the patient goes to bed and—if necessary—during the night. This drug acts as a nasal vasoconstrictor and decongestant.

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Cleidocranial dysostosis

Rachel Sclare. *Schweiz.Mschr.Zahnhk.* 69:1058-1059 Nov. 1959

Cleidocranial dysostosis is characterized by an incomplete ossification of the skull, malformation of the palate and aplasia of the clavicles. Patients afflicted with this syndrome usually are short in stature, a congenital condition which suggests that the long bones are underdeveloped. The etiology of cleidocranial dysostosis is not known.

An 11½ year old boy, exceptionally intelligent, was examined at the dental office. There was no history of cleidocranial dysostosis in any other member of the family. He was rather small in stature and slightly built; his height was 4 feet 6 inches and his weight 70 pounds. The head appeared quite large in relation to the body. The frontal bones and the upper orbital margins were prominent in comparison to the receding infraorbital margins and the depressed middle third of the face. These features are characteristic for cleidocranial dysostosis.

Dental examination revealed that the upper jaw had a deeply vaulted palate and there was a lack of downward and forward growth in the anterior region resulting in an open bite. Both jaws were extremely small. There was a prolonged retention of the deciduous teeth with the exception of the lower central incisors which had been erupted and shed normally. Roentgenographic examination revealed the presence of a supernumerary tooth impacted between the roots of the upper left and right central incisors.

The erupted molars were of average size but rounded mesially and distally. The only permanent teeth observed were the upper first molars and the lower left second molar which were partially erupted. The other unerupted teeth, including the third molars, could be seen in the roentgenograms, as were five additional unerupted supernumerary teeth.

Treatment consisted in surgical removal of the supernumerary teeth, maintenance of an excellent oral hygiene, and the replacement of shed and lost teeth by insertion of immediate dentures.

In view of the limited knowledge of this phenomenon, other treatment procedures had to be postponed.

5 Sandhill Drive, Alwoodley, Leeds, England

Mottling of palate

J.A.M.A. 171:631 Oct. 3, 1959

Q.—A middle-aged woman was referred to me by her dentist because of a whitish mottling of her palate extending from the gingival margins of the upper teeth for a half an inch or so out onto the palate. It has been asymptomatic. Because of some plaque formation, the dentist was concerned about the possibility of malignancy. Since the process is widespread, with no one area showing unusual thickening, I have not performed a biopsy. I have treated the area with silver nitrate on several occasions, with no appreciable change, although it gradually seemed to regress until lately. Please give an opinion as to probable diagnosis.

A.—The information given does not permit a clear conception of the condition present, but suggests it most likely would be focal hyperkeratosis or leukoplakia. However, the possibility of lichen planus cannot be eliminated. A biopsy specimen should be taken to establish diagnosis.

535 North Dearborn Street, Chicago 10, Ill.

Vertigo associated with nystagmus: an occupational disease of dentists

Quintessenz 10:74 Nov. 1959

Q.—About six months ago I felt for the first time a peculiar sensation as if the external world were revolving around me. The sensation was temporary and decreased by changes in position (lying down) or by a quick backward movement of the head. Medical examination revealed the presence of vertigo associated with nystagmus. There was no evidence of Meniere's syndrome or of cardiac, gastric or ocular disturbances.

The physician suggested that the disease may be caused by the unnatural position during the long working time at my dental office coupled by disturbances of the nervous system produced by overexertion, fatigue and apprehension.

Can objective vertigo associated with nystagmus be considered as an occupational disease of dentists?

A.—Similar case reports have occasionally appeared in dental literature. Occupational diseases

of dentists may be classified in regard to the possible causes such as: (1) unnatural position of body and head during work; (2) contact with infectious agents during practice; (3) disturbances of the nervous system due to excitation, laborious work, decrease in physical strength, or apprehensiveness, and (4) contact with or habitual use of drugs. Frequently, however, dentists under extreme occupational strain will not recognize the cause of their complaints but will diagnose the condition as being caused by rheumatism, senescence, and so forth.

Changes in position (sitting down) during work and avoidance of unnecessary muscle excitations are the only possible treatment methods.

In spite of the possible occupational hazards, the statistics of insurance companies prove that the health of dentists is superior to that of physicians, lawyers, veterinarians, chemists, pharmacists and executive employees of industry and commerce, and that they have a better life expectancy than members of other professions.

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Cause of cheilosis

J.A.M.A. 170:2265 Aug. 29, 1959

Q.—A 76 year old man in good physical condition has developed cheilosis and angular stomatitis. He wears dentures which he finds comfortable, is not on a restricted diet, and has been taking one tablet of an ascorbic acid and vitamin B complex supplement daily for the past ten years. For the last two months he has been taking 2 to 3 tablespoonfuls of barley malt extract as a laxative; this preparation contains 0.05 per cent butyl parahydrobenzoate as a preservative. Could this be responsible for the cheilosis? Might the fact that he has been taking both the laxative and the vitamin B supplement at breakfast be significant?

A.—Not all the categories of causes of cheilosis or cheilitis are known. Those best known are the type due to vitamin deficiency and that due to allergy. Vitamin deficiency should be ruled out in this patient. Allergic causes have been mainly of the contact type, although ingredients of foods are a possibility. Preservatives and other food additives have been particularly suspected in recent years to be the source of various types of allergy, and the chemical mentioned may fall in this category. If there are no clues as to contact allergy, a temporary (10 to 14 day) restricted diet may indicate whether any food allergy is involved. Also to be considered is the fact that the aged skin—particularly in the areas indicated, where it is subject to irritation from saliva—may be more prone to trophic changes and low-grade infection.

535 North Dearborn Street, Chicago 10, Ill.

Aphthous stomatitis

J.A.M.A. 171:130 Sept. 5, 1959

Q.—I have under treatment a patient aged 32 with intractable aphthous stomatitis. I read recently that nystatin has given surprisingly good results. Please advise on the value of that preparation.

A.—The causes of aphthous stomatitis are unknown, but apparently secondary invasion by microorganisms generally found in the mouth plays a role in continuation of the process. Therefore, in some instances, relief can be obtained by the use of appropriate antibiotics. Nystatin powder, or lozenges containing this antibiotic, will prove of value in some patients in combating secondary infection with *Candida albicans.* In other patients, powdered tetracycline will prove valuable as mouthwashes (Distelheim and Sulzberger, *J.Invest.Derm.* 13:115 1949) when secondary invasion by microorganisms sensitive to tetracycline has occurred. Recently, a preparation derived from *Lactobacillus acidophilus* and *L. bulgaricus* has been reported to give excellent results in relieving the pain and shortening the duration of the ulcers. The preparation is dissolved in milk and used as a mouthwash.

In some instances, recurrences are brought on by exposure to allergens such as nuts, shellfish, pork and chocolate. In others, trauma to the mucous membrane apparently initiates the attack. In these patients, careful avoidance of the offending type of exposure may result in long periods of freedom from oral symptoms. Despite all of these palliative measures, recurrent aphthous stomatitis often resists all forms of treatment.

535 North Dearborn Street, Chicago 10, Ill.

Roentgenology

Occupational radiation exposure to dental personnel: a preliminary report

James W. Miller, Simon Kinnsman and Robert L. Stockman. *Washington D.J.* 28:6-8, 18 Dec. 1959

A study to estimate exposures associated with current dental roentgenographic practices was conducted by the authors in cooperation with the Washington State Dental Association, the Washington State Department of Health, and the Dental Health Section, U.S. Public Health Service, Region IX. The study covered 352 dental offices involving 820 full-time personnel. Film badges were supplied and processed under contract with a commercial company.

Each office was visited, and information obtained by interview, measurements and examinations of the x-ray units. A floor plan of each office was drawn, indicating the location of the x-ray unit, other equipment and the position usually occupied by the dentist and other office personnel while taking roentgenograms of patients. In each office, a record was kept on the number of x-ray films used during the study, and the number of days the film badge was worn. Each person in each office was instructed to wear the film badge for eight weeks.

Almost half of all personnel received less than 5 mr during the eight-week study period. Two persons received over the recommended maximum permissible accumulated dose for occupational exposures (5 r per year, or an average dose of 0.1 r per week). Generally, the dentist received higher exposures than the assistants. All personnel whose duties did not involve operating the x-ray units received less than 5 mr; 99.4 per cent of the dental offices surveyed were below the maximum permissible dosage for occupational exposure, according to present knowledge and recommended standards.

Of the x-ray units surveyed, 20.9 per cent had both added or inherent filtration equivalent to 1.5 mm. of aluminum, and a collimating washer to limit the diameter of the beam at the skin to 3.25 inches or less; 16.5 per cent of the units had added aluminum filtration; 62.6 per cent had no added filtration and less than 1.5 mm. of inherent aluminum filtration.

Exactly 87.4 per cent of the units were operated at an eight-inch target-to-skin distance. The length of the timer cords ranged from 3 to 20 feet; 55.1 per cent of all units had 5-foot cords. In only six offices was the timer installed in a fixed position behind lead shielding; 15.5 per cent of all timers were inaccurate as much as 2.5 seconds in a 10-second period. Twenty-nine offices had some form of lead shielding for added protection. In 73.3 per cent of the offices studied, 50 or less roentgenographic exposures per week were made during the monitoring period. In 4.2 per cent, 100 or more exposures per week were made. In 37.2 per cent of the dental offices, very fast film was used; in 49.5 per cent, fast or medium speed film was used; in 13.4 per cent, a combination of the three types was used.

1. Although the vast majority of recorded personnel exposures were well below recommended maximum permissible dose, neither the absence of an actual or potential hazard nor the presence of good operative technic and equipment can be assumed.

2. Radiation exposures of or near the maximum permissible occupational dose received by dental personnel are caused by inadequate precautionary measures as a result of carelessness, ignorance or indifference.

3. Occupational radiation exposure in the dental office can be reduced to a practical minimum by adhering to the basic principles for protection from ionizing radiation.

U.S. Public Health Service, Region IX, San Francisco, Calif.

Fluoroscopy of the well child

J.A.M.A. 172:118 Jan. 2, 1960

Q.—Parents have stated that fluoroscopy was routinely performed on their children when they were examined. Is this a proper procedure?

A.—It is unwise to expose well children regularly to fluoroscopy for purposes of routine examination. Roentgen radiation should be used only when vitally needed. The limits of safety for radiation may be approached without adequate reason and later roentgen radiation may thereby become hazardous, for it is cumulative in its effect.

535 North Dearborn Street, Chicago 10, Ill.

Roentgen film lettering foil

W. G. E. Czech. *D.Echo* 29:174 Nov. 1959

A recently developed roentgen film lettering foil, called "x-ray assistant," facilitates identification of dental roentgenograms. The procedure of marking the roentgen films with the desired letters is simple. The required length of the lettering foil is removed from its protective cover and cut to size, leaving from 2 to 3 cm. of the covering, thereby permitting an easy pulling off of the next foil.

The foil is placed on a hard surface (glass), and inscribed with a ball point pen. The lettered foil then is attached to the margin of an unexposed film envelope, and the film is exposed in routine manner.

The desired identifying text is thereby transmitted to the film and will be clearly visible after development.

The use of the lettering foil eliminates the possibility of future inconveniences and confusions.

Straifstrasse 14, Stuttgart-Degerloch, Germany

Exposure of human gonads to ionizing radiation during dental roentgenography

Josef Bissing. *Schweiz.Mschr.Zahnhk.* 69:1075-1094 Dec. 1959

Systematic measurements of the gonad dosages received during the taking of dental roentgenograms were made at the Dental Institute of the University of Bern, Switzerland.

Because an intensive exposure of dental patients to the ionizing radiation for experimental purposes only would be hazardous, most of the measurements were taken on phantoms made of paraffin, although some measurements of the gonad dosages were made on male patients during the taking of routine dental roentgenograms. The comparison of the total gonad dosages received by the paraffin phantoms with those received by the dental patients indicated almost identical results.

The taking of roentgenograms of the upper jaw causes a more significant increase in the dosage received by the gonads than the taking of roentgenograms of the lower jaw.

The use of horizontally positioned protective lead shields covering the patient from the shoulders to the thighs reduced the gonad dosage to an insignificant level (0.1 mr). Unprotected patients received a gonad dosage varying from 13.79 mr (cephalometric roentgenogram) to 0.2 mr (diagnostic roentgenogram of an isolated incisor). The surface dosage in dental roentgenography, as demonstrated in the phantom measurements, varied between 0.0 r and 2.7 r, depending on the number of teeth exposed.

Dental roentgenography, for diagnostic purposes only, causes a mean gonad dosage of 0.17 mr per person and year, at the present rate of use of roentgen rays in Switzerland. Even though this dosage seems insignificant and cannot cause severe damage to the gonads, the total dosage of ionizing radiation may still be reduced to about one tenth (0.02 mr) by using adequate protective equipment without reducing the diagnostic value.

Because the dental profession has the duty to decrease the effects of ionizing radiation received by patients and personnel, adequate protective measures must be taken before using roentgen rays for therapeutic or diagnostic purposes.

Freiburgerstrasse 7, Bern, Switzerland

The gonadal exposure received by children during bitewing radiography

B. D. P. Williamson and A. B. Williams. *New Zealand D.J.* 55:180-189 Oct. 1959

A study was made of the exposure dose of radiation to the male gonads during dental bitewing roentgenography of child patients. The 186 dentists who participated in the study placed a radiation test film centrally in the lap of each child

receiving a pair of bitewing exposures during a one week period. At the end of the week, the film was marked with the total number of patients for whom roentgenograms were made while holding the film on their laps. The film was returned to a central laboratory and was processed together with control films previously exposed to known amounts of radiation. Each dentist used four test films for the four test weeks.

The average gonad test per patient per pair of bitewing exposures was 0.85 milliroentgens. The most frequently encountered gonad doses were in the ranges 0.3 to 0.4 mr and 0.5 to 0.6 mr. The range of results was from a barely detectable 0.02 mr (under a protective lead-rubber apron) to 5.3 mr.

The average male gonad dose for a pair of bitewing roentgenograms twice a year is of the order of 2 per cent of the genetically significant naturally occurring background radiation.

Where the best roentgenographic technics—long cone, fast film and optimum filtration—are used, the gonad dose is such as to make unnecessary the use of a protective lead-rubber apron.

Dominion X-Ray and Radium Laboratory, P.O. Box 1456, Christchurch, New Zealand

The gonadal radiation dose received by the people of a small American city due to the diagnostic use of roentgen rays

W. D. Norwood, J. W. Healy, E. E. Donaldson, W. C. Roesch and C. W. Kirklin. *Am.J.Roentg.* 82:1081-1097 Dec. 1959

Concern over gonadal radiation exposure is universal. The major peacetime sources of gonad exposure of whole populations are natural radiation and diagnostic and therapeutic application of radiation. The National Committee on Radiation Protection has recommended that the average gonad exposure of total populations be limited to 14 million rem per million people during the first 30 years of life, including 4 million rem of natural radiation.

This study, believed to be the first of its kind, attempted to evaluate gonad exposure from all diagnostic roentgen-ray procedures in a small city, Richland, Wash., with a population of 26,700 persons.

Records of all diagnostic roentgen-ray examinations were summarized by age, sex and body region for the period 1953 through 1956. Measurements were made using phantoms to determine gonad exposure during the various types of examinations. Estimates were made of the weighted gonadal dose to the population.

The weighted gonadal exposure from diagnostic roentgen-ray radiation in Richland was 1.3 r. This compares with the National Academy of Sciences' estimate of 4.1 r for the United States. Six per cent of the roentgenographic examinations, those involving the low back and abdomen, pelvis and thigh, contributed 78 per cent of the total gonad exposure.

A roentgenographic anteroposterior examination of the sacroiliac, for instance, resulted in a total gonadal dose of 3,000 mr to the male and 1,950 mr to the female. A dental roentgenographic examination resulted in a total gonadal dose of 1.07 mr to the male and 0.18 mr to the female.

Thirty-seven per cent of the total gonadal dose in the Richland study came from fluoroscopy involving the lower gastrointestinal tract.

About 60 per cent of the gonadal dose was received before 15 years of age, whereas only about 5 per cent was received after 35 years of age. This indicates a special need to minimize gonadal exposure to children.

An estimate of the relative major contributions to the total radiation dose to the gonads is as follows: natural radiation, 60 per cent; diagnostic roentgenographic radiation, 27 per cent; therapeutic radiation, 10 per cent; fall-out radiation, 2 per cent; occupational radiation, 1 per cent.

Proper filtration, improved coning devices with easily adjustable diaphragms, a combination of more sensitive films and screens, proper voltage and other factors are capable of greatly reducing gonadal exposure. The use of a simple lead-lined pouch to protect the male gonads is capable of eliminating most of the male gonadal exposure. With such a device in general use, the practitioner would not have to worry about balancing the gain from a low back or pelvic roentgenographic examination in the male against the genetic consequence.

Medical-Dental Building, P.O. Box 100, Richland, Wash.

Therapeutics

Drug names

Chauncey D. Leake. *J.A.M.A* 172:1197 March 12, 1960

The question of drug names is becoming important internationally. There is international uniformity with respect to the systematic chemical name for new chemical compounds that may be introduced as drugs. These chemical names are systematized and are meaningful to chemists but not to members of the health professions. Accordingly, relatively simple names for general public use are devised and these are referred to as "official," "generic" or "public" names. In addition, there are trade names, which are the legal property of the company exploiting the drug. Unfortunately, the generic names for drugs vary in different countries, sometimes because of trade name factors.

It is time that an international effort be made to bring about some degree of unity in connection with public or generic names for the same chemical compound which may be used as a drug in different parts of the world. The British Pharmacopoeia Commission devised "Approved Names" for drugs. The approved name is the official title of the drug should it be described in the *British Pharmacopoeia*. Lists of these approved names are distributed monthly by the General Medical Council of Great Britain to all physicians, dentists, veterinarians and pharmacists. These monthly lists of approved names also are distributed by the Royal Society of Medicine to its members, so that practitioners have ready reference to the approved names of drugs and can have some idea of what they are giving their patients. These lists contain proprietary names for cross reference.

The British Pharmacopoeia Commission has set forth ten guiding principles to be used in devising or selecting new approved names. It might be appropriate for American drug manufacturers and associations in the health professions to consider these guiding principles so that reasonable standards for drug names may be established in this country, and some progress toward international uniformity of drug names be made.

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Effect of vitamin B complex on experimentally produced chronic dental fluorosis

O. Dibák and M. Semjan. *Československ.stomat.* 59:412-417 Nov.-Dec. 1959

Rat incisors in which dental fluorosis had been produced experimentally by exposing them for 140 days to fluorine ions were examined by electron diffraction.

After the characteristic symptoms of mottled enamel had appeared on the tooth surfaces, the effects of a specific diet on development and progress of endemic dental fluorosis were investigated. The diet, fed for 100 days, contained large doses of vitamin B complex, especially thiamine, riboflavin, nicotinic acid, nicotinamide, pyridoxine, calcium pantothenate, and alpha and beta pyracin.

Four months after initiation of the vitamin B complex diet, and based on the microscopic findings in the mottled enamel, on the microscopic findings in longitudinal enamel sections, and on the histologic findings in dentin, the following conclusions could be made:

1. Administration of a diet containing large doses of vitamin B complex for more than three months provides a preventive and protective action against the toxicity of fluorine.

2. Vitamin B complex alleviates significantly the symptoms of endemic dental fluorosis.

The results of this preliminary study indicate the possibility that nutritional factors stimulating the normal metabolic functioning of the body (in experimental animals as well as in human beings) prevent or reduce the toxic effects of fluorine.

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Allergic emergencies

Roy Patterson. *J.A.M.A.* 172:303-305
Jan. 23, 1960

Severe constitutional reactions, ranging from dyspnea, cyanosis, fall in blood pressure, unconsciousness, collapse, coma and death may result from treatment with penicillin, foreign serum used as antitoxin, hyposensitization treatments with allergenic materials, and insect stings. Most severe allergic reactions and deaths in recent years have occurred from the administration of penicillin. Other injected materials, such as adrenocorticotropic hormone (ACTH) and penicillinase, have been reported to cause immediate reactions, presumably on the basis of a hypersensitivity reaction to a foreign protein.

The reaction may be immediate, occurring at the instant of the injection, but usually it occurs within 30 minutes. Death may occur immediately or in minutes to hours after the onset of the reaction.

To minimize severe allergic reactions, the practitioner should avoid administering materials likely to cause a reaction where there is evidence that it may occur. The patient's medical history is of great importance in determining the risk of administration of penicillin and horse serum, and it is necessary to ask every patient given these substances specifically about a history of sensitivity to penicillin or allergic symptoms after exposure to horses or horse serum. The patient cannot be relied on to volunteer this information. If a known drug allergy is revealed, this information must be displayed prominently on the patient's record. Oral administration of penicillin probably is safer than intramuscular injection, but this is no insurance against a fatal reaction since severe penicillin reactions have occurred after oral administration of penicillin, and even after use of penicillin lozenges.

Skin testing is indicated in the event of an uncertain history of penicillin sensitivity when penicillin seems the antibiotic of choice. A positive result of a skin test suggests that an immediate, severe reaction is likely, but a negative result does not exclude a severe reaction. Intracutaneous testing should be preceded by cutaneous testing, and very dilute concentrations should be used. The testing then may be continued by serial tenfold increases in concentration, and subsequently by intracutaneous testing with 10 to 10,000 units per cubic centimeter. Any material which has the potentiality of causing an allergic reaction should be injected in that part of an extremity where there is sufficient room to apply a tourniquet above the injection site if a reaction should occur.

When an immediate reaction has occurred, treatment must be initiated promptly, since even short delays may be fatal. The materials necessary for treatment should be kept readily available in a definite place in the office. The practitioner should review the steps he will take in preparation for such an occurrence.

If the injection of the drug causing the reaction has been given in the arm, a tourniquet is placed above the site of injection to slow down absorption. Epinephrine is given in the opposite arm, with use of 0.3 to 0.5 cc. of 1:1,000 aqueous epinephrine. The intramuscular route is best because, if the patient is in shock, the subcutaneous route of injection may result in very slow absorption. After the epinephrine has been injected intramuscularly, massage of the site of injection will increase the rapidity of absorption. To delay absorption of the antigen further, an additional 0.3 cc. of 1:1,000 aqueous epinephrine is given also in the site of the previous antigen injection.

An intravenously given antihistamine is the next measure to be considered, with use, for example, of 50 to 80 mg. of diphenhydramine hydrochloride injected slowly intravenously in an adult. Administration of oxygen should be started immediately if it is available. After the foregoing measures have been instituted, the patient may have recovered sufficiently to make further treatment unnecessary. However, further intensive treatment may be necessary. Administration of epinephrine may be repeated every 15 to 20 minutes. For persistent hypotension, an intravenous drip infusion of 5 per cent dextrose in water should be started, and therapy with a vasopressor agent such as levarterenol should be commenced at a rate sufficient to maintain the blood pressure at reasonably normal levels.

If bronchospasm appears, as demonstrated by audible wheezing or by examination of the chest, aminophylline can be administered intravenously

in a dose of 0.25 Gm. in 10 cc. of sterile saline solution over a ten-minute period. But if there is no evidence of bronchospasm and if the patient is in shock, the intravenous administration of aminophylline may promote a further fall in blood pressure, and would, therefore, be contraindicated. Laryngeal edema or laryngospasm may necessitate a tracheotomy during the course of the reaction.

If all the foregoing measures have been carried out and the patient still does not respond, the intravenous administration of adrenal corticoid steroids such as hydrocortisone sodium succinate in a dose of 100 mg. is indicated. Adrenal corticoid steroids are not the first choice of treatment, since they are relatively impotent antianaphylactic agents and also are too slow in action to be lifesaving in a few minutes, but in a patient in whom the other measures have not resulted in complete control of the reaction, intravenously given steroids are indicated for whatever additional benefit they may offer.

The reaction due to aspirin in the aspirin-sensitive asthmatic patient requires particular attention. The reaction generally occurs about 20 minutes after the ingestion of aspirin and the symptom is bronchial asthma of extreme severity. Death may occur shortly after onset of the asthmatic attack, or the patient may spontaneously recover. Emergency treatment consists of 0.3 to 0.5 cc. of 1:1,000 aqueous epinephrine given intramuscularly and removal of the aspirin by a stomach tube. Such patients never should be given aspirin to see if it will cause a reaction, and they should be warned of the sources of aspirin in "cold remedies."

The calmness of the practitioner in the face of impending catastrophe probably is one of the most important contributions to the management of allergic emergencies.

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Preoperative and postoperative medication

Leonard M. Monheim. *North-West Den.* 38:477-480 Nov. 1959

Preoperative and postoperative care of the dental patient depends largely on preoperative and postoperative medication. The judicious use of such medication, when indicated, can mean the difference between success and failure of the operation.

Preoperative and postoperative medication does not imply haphazard use of drugs, but rather a careful selection of the proper drug for a specific purpose, based on an understanding of the needs, condition and age of the patient.

Medication may be needed (1) to allay fear and apprehension, (2) to control pain, (3) to reduce infection, or (4) to augment previous medication.

Each patient should be evaluated physically by the dentist. The evaluation should consist of a pulse reading, taking of blood pressure, and a history.

The dosage of each drug must be suited to the needs of the individual patient. To rely on standard, average doses will doom therapy to failure, in a high percentage of patients.

Preoperatively, a patient's fear and apprehension may be controlled by the barbiturates or by a combination of barbiturates and ataractic agents. The author prefers to use pentobarbital sodium, secobarbital sodium, or phenobarbital. The dosage of the barbiturates can be reduced by combining the drug with promethazine (Phenergan). The dosages required to induce and maintain sleep have a considerable margin of safety and do not depress respiration or circulation appreciably.

Recommended dosages vary from patient to patient. On the average, dosages range from ¾ to 1½ grains of pentobarbital sodium with 12.5 to 25 mg. of promethazine.

If a patient is experiencing pain and if the dentist cannot establish the cause, the choice of premedication to relieve the pain is a drug possessing analgesic properties. Recently, a new group of analgesic agents, the non-narcotic, nonbarbiturate analgesics, has been introduced; although not as potent as the narcotics, they offer advantages over the commonly used weaker drugs. Some analgesics, with their doses for adults, are as follows: acetylsalicylic acid, 5 to 10 grains; acetophenetidin, 5 grains; ethoheptazine citrate with acetylsalicylic acid, two tablets (150 mg. ethoheptazine, 10 grains acetylsalicylic acid); dextro propoxyphene hydrochloride, 32 to 65 mg. Adult

doses of narcotics include the following: morphine, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$ grain; codeine, $\frac{1}{4}$ to 1 grain; meperidine hydrochloride, 50 to 100 mg.

If infection exists in the area of the needle insertion and thus renders local anesthesia impractical, the pain may be controlled with proper premedication until the infection subsides.

If recent ingestion of food by the patient prevents the use of general anesthesia, premedication can be used to control the pain until a general anesthetic can be administered.

An important phase of dental practice that often is overlooked is the postoperative period. With most patients, the dentist can determine accurately the need for postoperative medication, primarily directed to the control of pain, infection or hemorrhage. Pain may be controlled by analgesics or narcotics. The analgesics are those drugs which alleviate pain at a subcortical level and thus do not interfere with judgment or produce any cortical depression. The narcotics do produce a degree of cortical depression while they raise the pain threshold. The distinction between analgesics and narcotics is important for the dentist because he deals mainly with ambulatory patients. A patient taking analgesics can go about his daily activities; a patient on narcotics should not be allowed to go about or drive a car. Postoperative dosages of drugs for control of pain are the same as those suggested for preoperative use.

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Doriden: a quieting agent for anxiety in oral surgery

William B. Linenberg, James H. Dirlam and H. James Harpole. *Oral Surg., Oral Med. & Oral Path.* 13:59-62 Jan. 1960

Acute apprehension and nervousness probably are the most common emotional problems encountered in patients undergoing oral surgery. In an attempt to find a more effective premedication than the barbiturates for oral surgical procedures, the authors evaluated a new nonbarbiturate sedative, glutethimide (Doriden).

Glutethimide (alpha-ethyl-alpha-phenylglutarimide) is a sedative which is quick acting and of short duration. The compound is a white crystalline powder which is relatively insoluble in water but soluble in alcohol and in acetone. It has no analgesic effect, even with large doses. Body metabolism is not changed, oxygen consumption is not decreased, and body temperature is not lowered. Glutethimide has minimal effect on the cardiac and respiratory systems. The action of glutethimide administered by mouth begins in from 5 to 20 minutes, and the maximum effect is obtained in about 30 minutes. The duration of action is from four to six hours.

Seventy-nine men and women, ranging in age from 15 to 79 years, all with acute apprehension and nervousness, were selected from the outpatient oral surgery service of Grady Memorial Hospital.

Blood pressure and pulse values were obtained prior to the administration of 0.5 Gm. glutethimide, and 30 minutes after administration. The effects were graded as good, fair or poor. Of the 79 patients, 70 received glutethimide and 9 received a placebo.

Of the 70 patients receiving glutethimide, the sedative effect was judged "good" in 62 (88 per cent), "fair" in 7 (10 per cent), and "poor" in 1 (2 per cent). The placebo was effective in one of nine patients (11 per cent) in calming and relaxing the patient.

Of the patients receiving glutethimide, the average systolic and diastolic decreases in blood pressure were 14 mm. mercury and 7.3 mm. mercury. The average decrease in pulse rate was ten beats. Of the 70 patients, 9 had a feeling of drowsiness, 2 complained of being dizzy, and 1 patient was both dizzy and drowsy. There were no other significant side reactions. To the present time, no allergic reactions have been encountered. Allergic reactions to glutethimide have been reported by Howell (1956) and Grabe (1955), and several fatal cases as a result of massive overdosage were reported by McBay and Katsas (1957).

The several patients who were drowsy in the present series were treated with 10 mg. of methylphenidate hydrochloride, a mild stimulant and antidepressant. Within 15 minutes, all these patients were alert.

Grady Memorial Hospital, Atlanta, Ga.

Public health dentistry

The incidence and distribution of caries throughout the ages in relation to the Englishman's diet

J. L. Hardwick. *Brit.D.J.* 108:9-17
Jan. 5, 1960

Although it is accepted that caries is a disease associated with the so-called "civilized" diet, there is little agreement regarding the precise factors which increase caries susceptibility. There are three main theories to account for the harmful effects of the civilized diet: (1) that it contains fewer foodstuffs which promote vigorous mastication and a natural cleansing action on the teeth; (2) that it contains a greater proportion of quickly fermentable carbohydrates which are rapidly broken down by bacteria on the teeth to acid end products which then attack the hard dental tissues, and (3) that it contains fewer factors protective against caries, the exact nature of these protective factors being controversial.

There is probably no disease whose incidence is known so accurately throughout the ages as dental caries; carious lesions may be recognized with reasonable certainty in teeth which have remained buried for hundreds of thousands of years.

The estimated proportion of carious teeth and teeth lost or extracted because of caries appears to be as follows in England: Neolithic man, 8.3 per cent; Bronze Age man, 3.4 per cent; Iron Age man, 15.9 per cent; Romano-British, 17.3 per cent; Saxon, 10.0 per cent; Anglo-Saxon, 9.5 per cent; skulls from the plague era, A.D. 1665, 23.1 per cent; skulls from London, 1600 to 1800, 24.0 per cent; skulls from a cemetery, 1600 to 1800, 15.5 per cent; skulls from a cemetery, 1650 to 1834, 10.4 per cent, and recent man (1957), 48.6 per cent.

Although the changes in the national diet have been more pronounced in the last 150 years than ever before, they have been so numerous, often with several changes occurring nearly simultaneously, that it would be unprofitable to speculate on the factor or factors which produced the greatly increased caries incidence probably during the second half of the nineteenth century and continuing to the present. However, when the caries incidence and distribution are related to the diet throughout the ages, deductions regarding the major factors in the diet influencing caries may be made.

The theory that the harmful effects of the civilized diet are due to its containing fewer foodstuffs which promote vigorous mastication and a natural cleansing action on the teeth is consistent with the incidence and distribution of caries throughout the ages.

There is a most striking correlation between the consumption of refined sugars (and especially of sweets and chocolates which often are eaten between meals) and the caries incidence. It should be noted, however, that the increased consumption of refined sugar usually has been accompanied by a decrease in bread consumption, by a raising of the extraction rate of flour, or by the preparation of flours, bread and other cereal foods of finer texture. These latter changes would account equally well for the varying incidence of caries.

The caries incidence observed during and after the two world wars suggests that there are factors within food which protect forming teeth against caries subsequently. The changes in the incidence of caries throughout the ages, and especially in this century, do not support the theory that vitamin D deficiencies produce any major effect on caries incidence.

Changes in the processing of flour have been followed by pronounced changes in caries activity.

There also is a striking correlation between the observed caries incidence and changes in the diet which would result in the removal of protective factors of an inorganic nature, such as the refining of sugar and other foodstuffs, the production of low extraction rate flours, and possibly the use of artificial manures in agriculture. The observed caries incidences are therefore consistent with the theory that natural or raw foods contain protective factors of an inorganic nature, possibly as trace elements.

This study does not show which of the factors postulated in these theories produce major effects on caries susceptibility, nor does it indicate their relative importance. But it is noteworthy that all of the theories are directly connected with the refining of foods.

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A challenge to dentistry

Galen W. Quinn. *J.Tennessee D.A.* 39:301-310 Oct. 1959

A study has been made of dental care for indigent children in Memphis and Shelby County, Tenn. About 3,440 children (4 per cent of all school children) participate in the free lunch program. A dental survey of institutions for children revealed that only a few children were receiving voluntary dental treatment, and that of an emergency nature only. Dental examination of children in various schools has revealed that it is not uncommon to examine an entire class of children and find no dental restorations. In six schools with a student population of 3,075, exactly 21 teeth had been filled; 6,917 other teeth needed restoration or extraction.

If oral health is as important as dentists would like their education, incomes and titles to indicate, how much effort are they extending to see that all persons who need dental care are receiving that care? There are a few dentists who feel that they have no responsibility to provide care for patients who cannot afford to pay for dental treatment. Such dentists should re-evaluate their attitudes. This absence of a feeling of responsibility to the public stems from dental education.

Fifty years ago in dental education, emphasis was placed on restorative or surgical procedures and denture construction. Today the same attitude still is maintained in too many schools. It is well that the same emphasis in medical education was not placed on autopsies or better caskets. Many dental schools today base their curriculums on a 23 year old study made by the American Dental Association. How many businesses have survived using the equipment and procedures that they used 25 years ago?

When a patient registers in a dental school, he is assigned to a student. In the past, no plan for treating the patient to completion was required. The patient was considered to be a tooth, a unit restoration, or merely a credit toward graduation. Unless each dental student is trained to treat each patient to completion, the student will continue to look on treating the patient as credits toward graduation rather than to gain experience in practicing dentistry. The need for an intelligent dental examination, diagnosis and treatment plan is de-emphasized in some dental schools, and is not even required by many state boards of dental examiners. It might be better if restorative procedures were eliminated from the state board examinations, and examination, diagnosis and treatment planning were substituted.

In Memphis, the Memphis Dental Society, the College of Dentistry of the University of Tennessee, and the Public Health Department are looked on to provide dental treatment for indigent and semi-indigent patients.

The Memphis and Shelby County Health Department has a Division of Hygiene, staffed by a director, three clinical or field dentists, one hygienist and two assistants. One dentist and the hygienist are Negroes. The hygienist is carrying on a program of topical application of fluoride. One dentist and one assistant operate the mobile unit, and examine children in the various schools. The other dentist and assistant have portable equipment and provide dental treatment—mostly emergency procedures and minor operative treatment—for indigent patients in the various schools. It is hoped shortly that the division will have a three-chair clinic at Wellington Health Center. In the new Public Health Building there will be seven rooms, including offices, for the Dental Division. It is planned that two full-time dentists will provide treatment at the center.

The State Legislature in 1958 appropriated the first funds for the Dental Division of the State Department of Health. The state funds may be obtained for local use on a matching basis. Cooperative funds for January and February, 1959, were $2,000, and more funds have been applied for. Patients are screened by school officials and parent-teacher association groups and by local dentists who provide the service. The department of pedodontics and department of dental hygiene

of the University of Tennessee College of Dentistry enjoy an excellent relation with the Public Health Department, and many activities have been planned jointly for the benefit of dentistry and dental patients.

In Memphis many indigent patients are treated at the College of Dentistry. It would require an estimated $60,000 a year to pay for this service to indigents. Today, the city and county contribute nothing to the support of the College of Dentistry for dental care of indigent patients. If organized properly, a strong dental intern program supported by the city would be of great value. This would enable the profession and the city to take care of many more indigent patients. The city and county should be asked to support 12 one-year dental internships at $150 per month for the year. The interns could treat patients in the hospital. Inpatient dental service is needed in hospitals. Hospital administrators with whom this plan has been discussed are interested in obtaining such dental service.

A Foundation for the Prevention of Dental Disease might be started, to raise funds for providing dental care for indigent patients, for dental education, and for dental research. Perhaps the dental auxiliary should start such a program.

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Unoperated oral clefts at maturation I. Study design and general considerations

Frank E. Law and John T. Fulton.
Am.J.Pub.Health 49:1517-1524 Nov. 1959

Although the literature on the technics of treating oral clefts is voluminous, studies of the anomaly itself are few in number. There is no systematic description of the untreated anomaly in adults. This lack of knowledge concerning the latter aspect of the life history makes it difficult to evaluate treatment of cleft palate.

A study team of five dentists, a speech pathologist and an orthodontist visited Puerto Rico in June 1957 and again in June 1958. With the assistance of dentists, social workers and other personnel from the Insular Department of Health and local health centers, the team collected data on 124 native Puerto Ricans, ranging in age from 15 to 57 years. Untreated cleft palates were present in 51 subjects; 8 others had clefts involving only the lip and alveolar process; 29 had palatal clefts with prior surgical repair; the other 36 subjects had normal palates and served as controls.

Of the 88 subjects with treated and untreated oral clefts, 90 per cent were between the ages of 15 and 34 years. Posterior clefts were noted in twice as many women as men. Four of the five bilateral clefts occurred in men. Complete unilateral clefts and clefts involving only the lip and alveolar process were fairly equally divided between the sexes. Of 47 patients with clefts involving both lip and palate, 40 (85 per cent) had had the cleft lip repaired, but in only 18 (38 per cent) had repairs been attempted on the palate.

Subjects with untreated cleft palate appear to have developed well and to have followed normal facial growth patterns. These subjects were of average health and physical development when compared with the control group and others in the area. Subjects with untreated cleft palate did not appear to suffer the ailments commonly noted in subjects whose cleft palates had been repaired surgically.

Facial growth and development in subjects with untreated cleft palates appeared to approach that of normal adults more nearly than in many subjects whose cleft palates had been repaired. The growth of the upper part of the face and of the dental arch was closer to normal in subjects with untreated cleft palates than in subjects with treated cleft palates. Movement of the posterior pharyngeal wall during vowel phonation was better in untreated than in treated subjects.

The untreated subjects reported no more respiratory illnesses than did the control group. In untreated subjects, the turbinates were abnormally enlarged but the eustachian tubes usually were patent and apparently functioning normally.

Generally, untreated subjects had adapted well to speech difficulties. However, those with all types of palatal clefts consistently omitted "k" and "g" sounds. The voice quality in subjects with unrepaired clefts of the lip through the soft palate was nearly normal, whereas the voice quality in subjects with clefts of the soft palate

only was nasal. The speech sounds produced by subjects with untreated clefts involving the hard and soft palates appeared superior to the speech sounds produced by subjects whose clefts had been closed surgically.

Generally, the untreated subjects reported that as children at home they had been favored over their siblings, and that at school the teachers had tended to protect them. Most of these subjects, however, had considerable difficulty in school.

It is planned to continue and extend the study.

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The Askov dental demonstration: final report

Wm. A. Jordan, John R. Snyder,
John K. Peterson and Robert A. Johnson.
North-West Den. 38:445-465 Nov. 1959

In the fall of 1948 a ten year program was launched in Askov, Minn., to study the benefits for school and preschool children from a community dental health program providing approved preventive and control measures, dental health education through classrooms, dental health services to those desiring care, and annual dental examinations. All activities were centered around the Hans Christian Andersen School. In 1948 school enrollment was about 300; by 1958 it had risen to 329. Toothbrushing was supervised twice a day in the elementary grades, and toothbrushes and dentifrice were supplied the children for home use. Efforts were made to control excessive intake of sweets.

The percentage of "good" diets of the Askov children rose from 14 per cent in 1948 to 34 per cent in 1958; the percentage of "poor" diets was reduced from 67 per cent in 1948 to 34 per cent in 1958. Today, the diets of the Askov children are comparable to the diets of the children in Hinckley, the control community.

The study demonstrated a direct relation of low caries activity to low lactobacillus counts, and high caries activity to high lactobacillus counts. However, the lactobacillus count cannot be used to predict a person's caries activity.

After ten years, the dental caries rate was reduced by 28 per cent in deciduous teeth, by 34 per cent in children in the group 6 to 12 years old, by 14 per cent in children 13 to 17 years old. The carious surfaces rate was reduced by 29 per cent in children 3 to 5 years old, by 43 per cent in children 6 to 12 years old, and by 16 per cent in children 13 to 17 years old.

The number of teeth filled increased by 17 per cent in children 3 to 5 years old, and by 14 per cent in each of the groups of older children.

The number of deciduous molars and cuspids lost because of caries was reduced by 76 per cent. The number of molars and cuspids lost in the children 6 to 12 years old was not reduced, but there was a 50 per cent reduction in the number of permanent teeth lost in children 13 to 17 years old.

The study revealed no set pattern of caries activity related to age. It did show, however, a higher incidence of caries in children 12 to 14 years old. Dental caries incidence did not follow a pattern of starting low in children 5 to 6 years old and increasing gradually with the age of the children. The study demonstrated dental caries activity to be spasmodic and not steadily progressive.

The value of bitewing roentgenograms was demonstrated; without these, the dentist was missing from 22 to 30 per cent of instances of initial caries.

The cost of the Askov dental demonstration averaged $30.82 per child per year, including the cost of dental equipment, laboratory services, topical fluoride treatments, toothbrushes and dentifrices, dental services by family dentists, and salaries of personnel.

Askov did not have a community water supply in 1948; today it does have such a supply and the community is in the process of installing a fluoridation unit.

The study helped to substantiate the view that the fluoridation of community water supplies is the most effective and most economical health measure to reduce the incidence of caries. A community dental health program is effective only to the extent that it motivates the person to apply and practice the knowledge obtained.

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Histology

On the differentiation of the leukocytes in saliva in relation to the differential white cell blood count

P. E. B. Calonius and R. Gordin.
Suomen hammasläääk.toim. 55:93-96
June 1959 [in English]

The most common cellular elements occurring in saliva are epithelial cells and polymorphonuclear cells. The leukocyte count has been found to increase in instances of gingivitis. The daily variation in leukocyte count is considerable. The leukocytes have their origin mainly in the gingival capillary vessels.

The present work was undertaken to establish a simple method for the differentiation of leukocytes in saliva, and to compare the leukocyte count in saliva and blood.

Samples of saliva were taken from 161 children varying in age between two days and 14 years old. The saliva samples were taken with a pipet from mixed saliva on a slide and were spread out and left to stand until the saliva in the marginal parts began to dry. The samples were fixed in 95 per cent ethyl alcohol for two hours, and were stained with equal quantities of May-Grünwald stain and distilled water for five minutes. The preparations were rinsed in distilled water and left to dry in the air. In some instances, staining by Papanicolaou's method was carried out for purposes of comparison. Blood counts were taken from the same children within 24 hours.

Differentiation of the leukocytes in the saliva was found to be possible with either staining method. The differential leukocyte counts of saliva and blood were identical in only 8.7 per cent of the subjects. No correlation was found to exist between the total leukocyte counts of blood and saliva.

Very high leukocyte counts occurring in the blood were not observable in the saliva. The total leukocyte count of the saliva was considerably lower than that of the blood.

Local oral factors are thought to be responsible for the diversity of the leukocyte count. In pathologic processes and diseases of the oral cavity, in which the symptoms are reflected in the oral cavity, the leukocyte count in the saliva may possess diagnostic significance. Further study is expected to throw light on the effect of various oral diseases on the leukocyte count.

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Present status of electron microscopy of the human tooth

Wilson da Silva Sasso and Helena Souza Santos.
An.Fac.farm.e odont.Univ.São Paulo
15:21-35 1957–1958

Electron microscopy has been used for the last 15 years in the study of human teeth. Most of the earlier work dealt with the normal structure of the dental tissues. More recently, articles dealing with dental structure in various pathological conditions, such as caries and endemic fluorosis, and with the development of the teeth in relation to age, have begun to appear.

Two technics are being used in electron microscopy of the teeth. The first of these involves the making of a replica in a plastic material of the surface to be studied; the second, involving direct examination of the specimen, requires ultrafine sections only some hundredths of an angstrom in thickness. New methods of fixation and mounting, as well as radical modifications in the conventional microtomes, were needed to make this technic possible.

Enamel is the hardest substance found in the human body. When fully developed, it consists almost entirely of calcium salts deposited in the form of large crystals of apatite. Organic material makes up only 3 to 5 per cent of the enamel. Human tooth enamel is composed of delicate prisms arranged perpendicularly to the surface of the dentin. Each prism is joined to its neighbors by a cement known as the interprismatic substance. The structure of the enamel has been called fibrous, because it has a plane of cleavage which is normally parallel to the axis of the columns or rods. These rods, when seen in transverse

section under an optical microscope, present variations in form; some are hexagonal, some pentagonal, some scalelike, and so on. The same variations have been found in specimens seen under an electron microscope.

Although the interpretation of the electron-microscopic findings is still in an initial stage, the technical advances that have been made have opened the way for innumerable studies in the field of normal and pathological dental histology.

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Investigations into the mineralization pattern of human dental enamel

J. H. Allan. *J.D.Res.* 38:1096-1128 Nov.-Dec. 1959

This investigation was undertaken to re-examine the mineralization pattern of the enamel of human teeth by correlating the findings in roentgenographic and polarized light studies on ground sections with the findings in routine decalcified sections from the same teeth.

In the polarized light studies, ground sections were prepared from 52 deciduous teeth obtained from 17 necropsies selected to cover a period of development from 26 weeks in utero to 78 weeks postnatal. Each ground section was examined microscopically in transmitted light between crossed Nicol prisms in distilled water and in mixtures of distilled water and potassium mercuric iodide.

The polarized light studies showed that the mineralization of human enamel is a continuous process which occurs as follows:

1. The primary deposition of mineral matter starts shortly after the formation of the enamel organic matrix. This deposition, which is greatest in the earliest formed matrix at the cuspal portion of the dentinoenamel junction, decreases in concentration in a regular manner as the enamel surface is approached. Neonatally and postnatally formed enamel matrix may at this stage show sharp variations in mineral content parallel to Retzius' striae.

2. The primary deposition then advances cervically along the dentinoenamel junction and peripherally toward the enamel surface.

3. Secondary areas of slightly increased mineralization then appear in the outer third, cervical, and surface enamel.

4. The primary deposition continues to expand cervically and peripherally, at first roughly parallel to the enamel surface, gradually obliterating the secondary areas and variations along the striae.

Polarized light studies further showed that within a given dentition, the order of decreasing mineral content during development is: central incisor, lateral incisor, first molar, cuspid and second molar. Crystalline mineral matter is detectable in the organic enamel matrix shortly after its deposition. At no time during the whole process of mineralization, as observed under polarized light, was there any evidence of an influx of mineral matter starting at the incisal edge and proceeding cervically at right angles to Retzius' striae, as is suggested in the modified theory of Diamond and Weinmann.

Roentgen-ray absorption studies were carried out on the same sections. The findings agreed closely with those described in the polarized light studies. Mineral matter was detectable roentgenographically in developing enamel shortly after the commencement of organic matrix deposition. Again, no influx of mineral matter was found starting at the surface of the incisal edge and spreading cervically at right angles to Retzius' striae.

Routine decalcified sections prepared from the portion of each tooth remaining after the preparation of the ground sections were studied after staining. A broad similarity was noted between the direction and degree of advancement of the staining changes and the mineralization pattern of the same specimens, as shown by the roentgen-ray and polarized light studies. Both start at the incisal part of the dentinoenamel junction and, with increasing maturity, expand peripherally and cervically to involve the whole enamel. Probably a relationship exists between these two sets of phenomena, although the degree of accuracy with which one reflects the other still is uncertain.

Comparison of the patterns of mineralization and matrix loss shows less correspondence. The absence of complete identity between the three patterns limits the value of decalcified sections in the detailed analysis of enamel mineralization.

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Studies on dental caries

Kenji Shiota. *J.Osaka Univ.D.Soc.* 4:493-508 June 1959

Decalcified sections of mature enamel in human carious and noncarious teeth were examined histologically. Among the findings were the following:

1. The interprismatic substance, although it appears occasionally as a part of the prism on sectioning, should be recognized as an essential constituent of enamel, because of its physical properties and its resistance to caries.

2. Retzius' striae are more highly hypercalcified than the adjacent enamel tissue. This composition explains why caries, when penetrating into the depth of enamel, is arrested in its progress toward the pulp and spreads parallel to Retzius' striae.

3. The prism sheaths are not always observed through the whole thickness of enamel. They are a constant feature of the internal layer of enamel, but cannot be demonstrated in the middle layer. Prism sheaths in the external layer of enamel usually are observed in erupted teeth but not in nonerupted teeth. This fact suggests that the prism sheaths in the external layer develop posteruptively, probably as a result of the secondary infiltration of salivary constituents into the gaps between the loosely arranged enamel rods.

4. In the incipient stage of caries in enamel, either the prism sheaths or the rods are affected, but the interprismatic substance never is involved initially. In rampant caries, a condition found frequently in young adults, the carious process penetrates the prism sheaths promptly. In slowly progressive caries, which occurs in older people, the enamel rods are affected.

5. Two zones may be distinguished histologically in the carious lesion of enamel: (1) the altered zone, not yet invaded by microorganisms. The involved organic matrix, however, exhibits a more intensive staining reaction than the surrounding healthy matrix. There is a progressive loss of structural detail, and the rods become granular; (2) the infected zone, in which the microorganisms produce the preferential destruction of the rods, after which the infected matrix undergoes solution.

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A morphologic investigation of certain variations in the structure and mineralization of human dental enamel

Anna-Greta Gustafson. *Odont.Tskr.* 67:365-472 Sept. 1959

The structure of enamel is of fundamental importance to the initiation and progress of dental caries. The present study was carried out in an attempt to gain information on structural variations in the enamel. Special attention was paid to normal and abnormal Retzius' striae, hypermineralization and hypomineralization, and to other characteristics of the enamel surface. The developmental stages of the enamel formation were studied on tooth germs from human fetuses at various stages, from stillborn infants, from infants who had died shortly after parturition, and from monkey fetuses. Sections were stained with a great variety of staining methods and studied under polarized light, dark-field microscope, and in microradiograms.

Enamel is formed from material secreted by the ameloblasts. This secretion is continuously divided into small portions with the edges at right angles to the long axes of the prisms. A tremendous number of variations in enamel structure may develop. These variations, in turn, can be due to variations in the composition and amount of the secreted material, and also to variations in the degree of condensation and mineralization.

The shape of a tooth is produced by bends in the enamel prisms. These bends occur at the junction between prism sections. Along these functional Retzius' striae there is a tendency to disturbances both in the organic stroma and in mineralization. These result in what the author terms pathologic Retzius' striae. In addition to the pathologic Retzius' striae, a number of types of diffuse disturbances occur. The most common type is due to abnormal mineralization which results in changes in the enamel's birefringence and degree of mineralization. Disturbances in mineralization are more common than previously has been believed. In the present material, there was not one tooth which was entirely unaffected.

The character of the outermost layer of enamel is influenced by the bends in the prisms which are necessary to produce the contours of the

tooth. These bends occur along the functional Retzius' striae and form perikymata where they reach the outer enamel surface. The smooth outer enamel surface also is partly due to major variations in the structure of the prisms. Some prisms run straight out at right angles to the outer surface whereas others bend and have shorter sections.

Functional Retzius' striae usually tend to run together at the enamel surface as the area between them diminishes continuously. Two Retzius' striae usually meet in the hollow between two perikymata. Excessive development of these hollows produces hypoplastic pits. These pits are the result of three or more Retzius' striae meeting at one point on another Retzius' striae which was formed before the disturbance. Hypoplastic pits also can result from compression of prism sections in a limited area.

The innermost layer of enamel usually is highly mineralized. Our knowledge of enamel still is very limited. In particular, little is known of the birefringence of the organic stroma. Variations in structure and mineralization are great, even in clinically normal material. Future investigations must try to establish the relationship between caries susceptibility and enamel defects.

There are 156 plates and 124 bibliographic references.

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Histological and histochemical characteristics of apical granulomas

Miroslav Obručnik and Josef Meduna
Českoslov.stomat. 59:317-328 May 1959

Dental granulomas, formed by granulation tissue at the root apexes, undergo characteristic histological and histochemical changes.

During the period of tumor development, a significant increase in the number of mucopolysaccharides occurs within the intercellular substance of the granuloma. The condensation of hyaluronic acid and hyaluronidase results in a densification of both the intercellular and the interfibrillar substances. Simultaneously the formation of perifistular layers also consisting of mucopolysaccharides occurs involving the continuously multiplying collagenous fiber bundles.

The histochemically demonstrable changes within the granuloma produce structural changes as well as a decrease in tissue permeability.

At no stage of granuloma development was it possible to detect pure lipoid in the intercellular substance, although small amounts of lipoprotein were present in the mass of granulation tissue. Traces of tissue glycogen were found in newly formed granulomas. The extracellular activity of alkaline and acid phosphatase appeared to be insignificant. In chronic stages, the phosphatase activity increased and shifted to the peripheral parts of the granuloma.

Glycoprotein and mucoprotein compounds appeared in the cells of granulomatous lesions, especially in the granulocytes and eosinophil granules within the cytoplasm.

No metachromatic effect after staining with toluidine blue could be demonstrated. Histiocytes, containing glycoprotein and mucoprotein, were found in small amounts, characterized by a partly evident activity of acid phosphatase within the peripheral parts of the granuloma.

Immense numbers of multinucleated cells occurring in chronic granulomas were found to be either negative or slightly positive in their reactions to carbohydrates, although they were positive in their reactions to acid phosphatase. It can be assumed, therefore, that these multinucleated cells derived from histiocytes.

Epithelial fragments of sheath of Hertwig (Malassez's rest) were found in the periodontal membrane involved in the granuloma development, and contained glycoprotein and mucoprotein but neither lipoid nor lipoprotein.

In the cellular detritus of the necrotic parts of the granuloma, the presence of nucleoprotein, glycoprotein and lipoprotein could be demonstrated whereas the presence of pure lipoids such as cholesterol could not be established.

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Pathology

Silicious deposits in the oral soft tissues of industrial workers

E. C. Fox and E. A. Marsland. *D.Practitioner* 10:64-70 Nov. 1959

A man attending the Birmingham Dental Hospital complained of gingival hemorrhage, inability to wear his lower partial denture, and a peculiar feeling of roughness and irritation of his oral mucosa, and of occasional swelling of the regional lymph glands on the left side. The gingiva was inflamed and slightly hyperplastic. The inner aspect of the lower lip had a slightly granular appearance. Routine roentgenographic examination showed some loss of bone around the remaining teeth and an unusual distribution of small radiopaque areas in the lower lip.

The remaining anterior teeth were extracted and biopsies taken of both the lip and gingiva. Microscopic examination of the lip sections showed the presence of numerous foreign body giant cells containing birefringent crystalline particles. Measurement of the refractive index of these birefringent crystals indicated that they were silica. There seemed little doubt that these aggregations were related to the radiopaque areas seen on the roentgenograms. The patient said that some years previously he had worked in the glass industry, cutting, grinding and polishing glass.

Fifty-three workers in three occupations associated with the presence of silicosis were then examined. Of 32 foundry workers, 10 had small radiopaque areas in the lips. Of three pottery workers suffering from silicosis, two had radiopaque areas in the lip. Of 18 coal miners, 8 had such lesions. Thus, of 53 workers examined, 20 had radiopaque lesions in the lips. Fifty patients who had never been exposed to industrial dusts containing silicious matter were examined; no radiopaque areas were present in either the lips or the gingiva in this control group.

Only 1 of the 20 patients with radiopaque areas in the lips complained of any discomfort associated with the lesions.

It is not suggested that the radiopaque areas were due to the silica directly. There is evidence (Holt, 1957) which indicates that tissues affected by the presence of silica become impregnated with calcium to form a calcium-protein complex which is radiopaque.

The majority of patients who had radiopacities in the lips were diagnosed as suffering from pneumoconiosis. If, as a result of further investigations now under way, the relationship between the radiopaque areas, deposits of silicious material in the oral soft tissues, and pneumoconiosis can be clarified, it may be that roentgenographic examination of the lips of workers in certain occupations can help in the early diagnosis and prevention of lung disease. If it can be shown that the oral lesions are specific, it would be of value to know whether they precede the onset of pneumoconiosis and whether they bear any relationship to susceptibility to the serious lung condition.

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Benign hypertrophy of masseter muscle

H. Oppenheim and M. Wing. *A.M.A.Arch. Otolaryng.* 70:207-210 Aug. 1959

Three cases of benign hypertrophy of the masseter muscle are reported. The paucity of reports on this condition may be due to its comparatively small clinical importance and to the difficulty in differential diagnosis. Diagnosis is aided by the identification of a triad consisting of a growth in the masseter region, sialographic demonstra-

tion of a laterally displaced Stensen's duct in the presence of normal filling of the parotid gland, and roentgenographic evidence of an exostosis at the mandibular angle.

In the congenital or familial type of benign hypertrophy of the masseter muscle, the patient has a "chipmunk look," because the muscle stands out in a thin or bony face. The patient with the commoner, acquired type is tense and habitually clenches or grinds his teeth in sleep.

Trauma plays no part in the development of the hypertrophy. The onset of the acquired form usually is gradual, extending over a period of several months. Often the patient is unaware of the painless swelling. The growth may subside spontaneously, but usually recurs rapidly.

Therapy consists essentially in reassurance, correction of faulty habits of mastication, and, of course, restoration of a normal occlusion, by prosthesis if necessary.

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Leukemic reaction of the oral mucosa

Hans Günther Engelhardt. *Deut.zahnärztl.Zschr.* 14:1613-1619 Nov. 15, 1959

The presence of leukemia, especially in children and young adults, is not infreqeuntly discovered incidentally during examinations at the dental office. The recognition and evaluation of certain oral manifestations of this disease, at an early stage, will permit a planned and controlled treatment by the medical specialist, thereby not only prolonging the life of many patients, but promoting—at least temporarily—the well-being of the patient as well as his confidence and optimism.

Certain oral conditions—for instance, gingivitis with a characteristic blue discoloration of the mucous membrane; ulcerating, necrotizing and gangrenous processes, and a tendency to spontaneous hemorrhage without local cause, all associated with anemia and extremely poor general health—should be considered by the dentist in his differential diagnosis as being associated with a systemic disease which, only too often, will be a form of leukemia.

In instances in which the dentist suspects that the oral symptoms observed are leukemic reactions of the mucous membrane, the medical specialist can decide early which treatment method is indicated or whether he will institute or withhold immediate therapy.

In instances of chronic granulocytic leukemia, in which the medical diagnosis often is based on the findings of dentists, that is, before the onset of the other clinical, nondental symptoms, the treatment can be initiated without delay.

In instances of chronic lymphocytic leukemia, however, most specialists prefer to delay treatment until there is additional evidence of a leukemic activity, that is, when the leukocyte count is above 100,000 per cubic millimeter, or there is a significant degree of anemia or thrombocytopenia.

Unfortunately, in most patients in whom oral manifestations of leukemia are discovered by dentists, acute leukemia—which invariably is fatal—will be the diagnosis.

In acute leukemia, chemotherapy (cytostatics or cortisone preparations) has, as yet, not been able to check sufficiently the progress of the disease, nor have serial blood transfusions combined with antibiotic therapy.

The treatment modalities are essentially the same for all forms of leukemia. Best results—after an early recognition—are obtained in patients with highly undifferentiated (hemocytoblastic, stem cell or lymphocytic) forms of leukemia, whereas least benefits are achieved in patients with acute or subacute monocytic leukemia.

If dentists are unable to recognize the leukemic reactions of the oral mucosa, the possible chances of their patients for improvement are missed, and the fatal outcome will be accelerated.

Weimarerstrasse 8, Kiel-Wik, Germany

Effects on palate development of mechanical interference with the fetal environment

Bruce E. Walker. *Science* 130:981 Oct. 16, 1959

Puncturing the amniotic sac with a hypodermic needle just prior to closure of the palate can cause cleft palate in fetal mice. To explain this effect, it has been suggested that amniotic fluid leaks out, reducing hydrostatic pressure in the amniotic cavity and allowing the uterus to compress the

fetus. The fetus' head then would be pressed against its chest, the lower jaw and tongue being forced up toward the nasal septum. Pressure on the tongue from below could prevent normal palate closure.

To test this hypothesis of uterine compression, operations employing various combinations of amniotic fluid withdrawal and release of the embryo from enveloping membranes were performed just prior to the time of normal palate closure. Thirty-four pregnant mice were treated 13⅔ days postconception, and 25 were treated 14⅓ days postconception. The females were reopened at 18⅓ days after conception, and the condition of the fetuses was recorded.

Of the embryos treated by withdrawal of amniotic fluid, 24 had normal palates, 23 had cleft palates, and 104 fetuses were resorbed. Of the embryos treated by withdrawal of amniotic fluid and release of the embryo by slitting the uterus lengthwise, 34 fetuses had normal palates, 18 had cleft palates and 89 were resorbed. Of the embryos released from the uterus, 37 had normal palates and 0 had cleft palate. Of the embryos released from all membranes, 3 had normal palates and 0 had cleft palate.

Release from the uterus obviously does not protect the fetus from developing a cleft palate. However, the cleft palates that develop in released fetuses still are dependent on loss of amniotic fluid, since the control fetuses released from the uterus did not develop clefts. Perhaps the amnion-yolk sac membranes can exert sufficient pressure to account for the cleft palates that developed in the released, amniotic-fluid-deficient fetuses.

University of Texas Medical Branch, Galveston, Texas

An old wives' tale

I. M. Cullum. *Brit.M.J.* No. 5150:497-498
Sept. 19, 1959

The condition of tonguetie is not mythical, although surrounded by an aura of superstition and old wives' tales. The baby referred on account of alleged tonguetie is an everyday experience in pediatric practice. As a young and inexperienced hospital resident, the author used occasionally and somewhat lightheartedly to snip the frenum of the tongue in some of these babies. Recently, the chance appearance of two babies who appeared to derive considerable benefit from this minor operation impelled the author to undertake research into the history of tonguetie. A baby girl, four months old, was referred because she was always dribbling, and when she took her bottle the milk ran down her chin and she screamed while being fed. The mother said the baby seemed unable to suck properly and usually took an hour for each feeding. The frenum of the tongue was snipped by a surgeon. The result was dramatic; within an hour the baby was sucking well from a bottle and within two days was being spoon-fed. Another infant, with much the same symptoms, had a similar operation with similar satisfactory result.

John Pechey in 1697 wrote a treatise on the diseases of infants and children, published in London. He said: "The midwife at birth must put her finger into the mouth and cleanse it from all filth and see whether the child be tongue-tied or no." He did not say what should be done if the child had this condition. In 1742 Jean Louis Petit, in Paris, reported two instances of death from tongue swallowing after the operation for dividing the frenum of the tongue. In 1764 John Theobold, London, wrote that "it may be necessary to cut the bridle of the tongue and this is usually done by nurses and midwives with their nail." He suggested using a sharp pair of scissors.

Other authors to discuss tonguetie were Nils Rosen von Rosenstein (1776), Stockholm, William Moss(1794), Liverpool, and a Dr. Young (1761), Edinburgh.

That tonguetie may be a definite clinical entity seems to be supported by recent work by Colley and Creamer (1958), who note that the backward movement of the tongue within the mouth in sucking is probably the method of producing the negative pressures they observed. It is possible that tonguetie may lead to at least two disabilities in later life. The small boy who cannot protrude his tongue adequately is at a distinct disadvantage. And I am told by my dentist that in patients who require dentures a short frenum of the tongue often gives rise to difficulty and embarrassment in eating and talking.

Tavistock Square, London W.C.1, England

Pathologic changes in the mucous membrane of the oral cavity

L. Lebourg. *Actual.odontostomat.,Paris* 47:245-263 Sept.-Dec. 1959

Polymorphic in its anatomic structure, adapted to various functions and endowed with bacteriostatic power, the oral mucosa is sensitive to certain pathogenic microorganisms such as bacteria, spirilleae, viruses, molds and yeasts. The oral mucosa may be affected by different physiopathologic factors which are at times active in the mouth, and it is frequently the site of various types of malignant or benign tumors.

Autochthonous polymicrobial invasion, however, can no longer be considered the determining factor of infections of the oral mucosa because antibiotic therapy has been successful in reducing the incidence of these infections. If they occur, they are of streptococcal, viral or mycotic origin. The use of antibiotics has appreciably modified the problem of stomatitis involving the buccal and labial mucosa, palate, tongue, floor of the mouth and gingivae, whether caused by local or systemic factors.

Infection is not the only dominant factor in pathologic conditions of the oral mucosa; race, heredity, environment, diet, oral hygiene, endocrine and vitamin metabolisms, conditions of the blood, the circulatory and nervous systems may affect the oral mucosa because all parts of the human organism are interdependent. Within the human body, any physiologic or pathologic change may influence the function and mechanism of other, sometimes quite distant, regions.

The mucous membrane of the oral cavity is involved in the activities of two specific groups of systemic affections, one associated with the alimentary tract and the other with the lips and the facial skin. In both groups, allergic reactions, local or general, to particular allergens may occur although seldom involving the oral mucosa directly.

In pathologic changes of the oral mucosa, malignant tumors play an important part because they are becoming more and more frequent. It is possible, although not certain, that an increase in the incidence of oral tumors is proportional to the lengthening of the human life expectancy experienced today.

The dentist must use every possible means to detect malignant changes or manifestations in the oral cavity at an early stage, although an early diagnosis does not always ensure cure.

Surgical enucleation of oral tumors still appears to be the best treatment method, followed by roentgenotherapy and electrosurgery which frequently are indicated to eliminate oral metastases.

The diagnosis of malignant tumors of all soft tissues such as the oral mucosa is difficult because often the initial clinical symptoms are observable only after the tumor has developed. If, however, any condition in the oral cavity arouses suspicion of malignancy, an immediate biopsy is indicated. Contrary to the belief held by many laymen, biopsy does not promote metastasis.

Hôpitaux de Paris, 11 Rue Quentin-Bauchard, Paris 8, France

Bacteremia after tooth extractions and periodontal treatments requiring surgical interventions

Götz Linzenmeier and Ernst Lautenbach. *Schweiz.Mschr.Zahnhk.* 69:787-795 Sept. 1959

A clinical investigation of transient bacteremia was carried out at the Hygiene Institute and the Dental Institute of the University of Bonn, Germany. It was designed to evaluate the following problems occurring in dental practice: (1) the presence of transient bacteremia after tooth extraction; (2) the frequency of transient bacteremia after periodontal treatment requiring surgical intervention, and (3) the prevention of bacteremia by preoperative or postoperative antibiotic therapy.

One hundred and four patients were studied who had acquired transient bacteremia either after tooth extractions or after surgical procedures during periodontal treatment. A control group of 54 patients who had undergone the same dental, periodontal and oral surgical procedures received no antibacterial treatment.

The results were as follows:

1. Transient bacteremia occurs more frequently (12 per cent) after tooth extraction than after periodontal treatment requiring surgical intervention (2 per cent).

2. Blood cultures taken immediately after tooth extraction were positive in 28.3 per cent of patients who received no antibiotic therapy.

3. The incidence of bacteremia was reduced in patients who received penicillin in a daily dose of 600,000 to 800,000 units for from four to ten days prior to tooth extraction.

4. The incidence of bacteremia in patients receiving from 600,000 to 800,000 unit doses (half doses for children) of procaine penicillin was not reduced significantly below that of the control group.

5. Antibiotic therapy to prevent bacteremia is recommended, especially in patients with pyogenic oral infections, endocarditis and rheumatism.

Pettenkoferstrasse 11, Munich 15, Germany

Serial examinations of dental patients for determination of unrecognized diabetes mellitus

Volker Schliack. *Deut.med.Wschr.* 84:1446-1448 Aug. 14, 1959

Since 1951 several independent systematic investigations of the incidence of previously unrecognized diabetes mellitus in dental patients were carried out by dentists in different parts of the West German Federal Republic. The data obtained were accumulated and evaluated at the Diabetes Center in Berlin.

These investigations revealed an unexpected over-all incidence of unrecognized diabetes mellitus of at least 1.5 per cent of dental patients. It was highest in the age group above 40 years and higher in women than in men.

An analysis of 14,000 new cases, recognized by dentists and confirmed by physicians during the year 1957 only, indicated a peak incidence in the age group above 60 years.

About 50 per cent of dental patients in whom the disease was recognized by dentists had a comparatively mild form of this metabolic disorder and could be treated by dietary procedures alone, although some patients exhibited the symptoms of diseases of the blood vessels or of other complications of diabetes mellitus.

The symptoms of diabetes mellitus, recognized by dentists, appeared at the onset as gradual loss of weight, fatigue, thirst and polyuria. The oral symptoms consisted of xerostomia and a peculiar form of halitosis (sweet odor). In most instances, the tongue was dark red, enlarged and there were regions of severe pain sensations. In more than 80 per cent of patients, there was a tendency to formation of supragingival calculus. The gingivae usually were spongy and purplish, and there was a tendency to hemorrhage. Gingivitis, of a persisting type, seemed to be associated with diabetes mellitus. In these patients, there appeared to be a concomitant resorption of the alveolar bone which led to progressive pocket formation and tooth mobility.

Klosterstrasse 64, Berlin C 2, Germany

Acute leukemia in dental patients

L. Sugar. *Rev.Belge Sci.dent.* 14:373-379 Sept.-Dec. 1959 [in German]

Acute leukemia frequently begins with oral manifestations such as hemorrhage, ulceration, swelling and pain in the gingivae; therefore, many patients in the initial stage of the disease consult the dentist and not the physician. Although acute leukemia is invariably fatal, an early diagnosis making possible a carefully planned and controlled treatment may not only prolong life but promote—for a certain time—well-being, thereby instilling confidence and optimism in patients and their relatives.

Fifteen patients, eight men and seven women, from 20 to 70 years old, were observed at the Dental Clinic of the University of Budapest, and the diagnosis of acute leukemia in its initial stage, made by dentists, was verified later at the Medical Clinic.

Seven patients were admitted to the Dental Clinic for treatment of periostitis or ulcerating stomatitis. In three patients, the oral symptoms indicating the presence of acute leukemia appeared after tooth extraction.

In the other eight patients, the initial symptoms were of a chronic nature. In four patients, edema was present in the extremely pale oral mucosa, and in the others, hemorrhage of the gingival tissues without injury occurred.

In the 15 patients with acute leukemia, ulceration of the gingivae was found in 12, swellings of

the oral mucosa in 9; and hemorrhage—which according to textbooks is the most frequent initial oral symptom of the disease—only in 7.

The most characteristic symptom in this series was a seemingly insignificant necrosis on the tip of the interdental papillae. This necrosis rapidly spread to other regions of the oral cavity; the teeth appeared grayish, and an offensive breath was observed in all patients, probably produced by the abscesslike ulcerations.

For early diagnosis, besides the oral symptoms, certain general symptoms such as weakness, fatigue and paleness of the skin are important. Patients give the impression of being seriously ill, even if the disease is in its early stage—a condition which cannot be associated with any dental or oral disease.

The final diagnosis, however, can be based only on the determination of the increase in number of leukocytes and their precursors in the blood (more than 100,000 per cubic millimeter).

The presence of acute leukemia frequently is discovered incidentally during the course of a dental examination.

Mária Utca 52, Budapest 8, Hungary

Changes in the rhythm of tooth mobility in patients with masticatory parafunction

Helmut A. Hirt. *Quintessenz* 10:31-32 Nov. 1959

In a dental examination, the recognition of an existing masticatory parafunction, probably produced by bruxism or bruxomania, until now depended on the highly subjective statements made by the patients and on the often insufficient results of the objective observations made by the dentist.

A method to measure and evaluate disturbances in the rhythm of tooth mobility associated with masticatory parafunction has been tested at the Dental Institute of the University of Zurich, Switzerland, in patients with bruxism or bruxomania.

Measuring and recording of the degree of tooth mobility were carried out according to the technic described by Mühlemann in 1957. The rhythm of tooth mobility in the upper incisors was registered at 8 A.M. and 4 P.M. for several days. The patient's general health condition, the results of the functional analysis of his dentition (in regard to anomalies in tooth position, the presence of overbite in the incisor region, the degree of attrition and malformation of cusps), disturbances in function of the temporomandibular joint, pathologic changes in gingival tissue and periodontium and the consistency (hard or soft) of the diet (especially breakfast) were recorded separately.

After measurement of the degree and rhythm of tooth mobility in patients with habitual grinding or gnashing of the teeth during sleep or while awake (whether or not due to neurosis), acrylic plates were inserted during the night which prevented the contact between the upper and lower anterior teeth. Before removal of the acrylic plate in the morning, the tooth mobility was measured again.

The following conclusions, based on the measurements, could be drawn:

1. Disturbances of the rhythm of tooth mobility in patients with bruxism or bruxomania caused damage to the periodontal tissue.

2. Independent from the produced masticatory parafunction in these patients, a statistically significant change in the day and night rhythm of tooth mobility was determined. The genesis and pathogenesis of this phenomenon will be investigated by further experimental tests.

Zürichbergstrasse 4, Zurich, Switzerland

General

Facial anomalies and philately

Rolf Lützelberger. *Zahnarztl.Praxis* 10:184 Aug. 1, 1959

Philately, collecting and studying of postage stamps, is a scientific term which was created by M. Herpin, a French stamp collector, in 1865, who derived it from the Greek words *philos* (love) and *ateleia* (untaxed).

Although the first postage stamps were issued by Postmaster General Henry Bishop of Great Britain in 1840, (the United States issued the first so-called "Postmaster's Provisional Stamps" in 1856), stamp collecting did not become a world-wide hobby until 1863 in which year the first stamp catalogues (*Gibbon's Stamp Catalogue* in Great Britain and *Scott's Standard Stamp Catalogue* in the United States) were published.

Perhaps no other hobby has been so readily accepted by professional men as philately and has been so prolific of literature. Philatelic societies were formed in most countries and cities of the world; the philatelic societies in the United States are associated in the National Federation of Stamp Clubs which governs philatelic congresses and exhibitions.

Facial anomalies have played an important role in the arts of painting and sculpture from ancient times until today. Many artists have emphasized the emotions of their subjects by extensive distortions of lips, cheeks and teeth, whereas other artists have selected specific dental topics.

Until recently, the artists who designed postage stamps have carefully avoided distortions and exaggerations in presenting the faces of famous persons to be honored by issuing so-called "commemorative" stamps. The few exceptions, discovered in the author's stamp collection (see illustration), are as follows:

1. Prognathism (mandibular projection) is exhibited in a stamp commemorating the 200th birthday of the Swiss educator, Johann Heinrich Pestalozzi, issued by Switzerland in 1946.

2. Distoclusion is shown in a series of stamps honoring the former president of Germany, Theodor Heuss, issued by the West German Federal Republic in 1954.

3. Prognathism (maxillary projection) is presented in two "Pro Juventute" (semipostal) stamps, issued by Switzerland in 1937. The subject's projecting jaws unquestionably have a gnathic index far above 103, thereby requiring orthodontic treatment. The artist attempted to picture a child's face of a type which he imagined as being "ideal" and "beautiful."

4. Prognathism (mandibular projection) obviously was selected by the artist who designed the stamp honoring labor, to express power and energy in the miner's face. This stamp was issued by the then independent Saarland in 1948.

These examples as well as others not represented in the author's collection (such as the stamp honoring the German playwright and poet, Bert Brecht, and the stamp series "Helper of Mankind," all showing the anomaly of prognathism, issued by the East German Democratic Republic in 1954) demonstrate that the artists and postal officials who approved these designs felt that certain facial anomalies can be regarded as beautiful or at least as "normal."

By studying the postage stamps issued by the governments of other countries of the world, dentists and especially orthodontists who are devoted philatelists, may find many other examples of dental or facial deformities. Such a project would constitute an interesting undertaking: dental research in philately.

Wehnerstrasse 20, München-Pasing, Germany

The extraction of deciduous teeth

G. Ashcroft and O. M. Pawsey.
D.Practitioner 9:236-239 June 1959

Care should be taken during the extraction of deciduous teeth to avoid damaging the underlying, developing permanent tooth and to avoid fracture of the deciduous tooth root, particularly when it is still attached firmly to the bone.

Light forceps no. 163 should be used for extracting upper incisors, no. 76 for upper molars and no. 74 for all lower teeth. Controlled thrust should be exerted apically along the periodontal membrane through each forceps blade so that the tooth is raised within the cone formed by the blades. An initial dilatation of the socket is required before an attempt is made to remove the tooth.

The deciduous teeth may be divided into three groups, according to the morphologic features of their roots. The forces and movements recommended for extraction are the same for all the teeth in one group.

1. In the extraction of single-rooted teeth (incisors and cuspids), the no. 163 forceps blades are applied across the buccolingual axis, forced up the periodontal membrane, and a firm, controlled grip made on the cementum. This thrust and grip are controlled by the right thumb on the forceps and the left index finger and thumb on either side of the gingiva immediately adjacent to the tooth being extracted. The tooth and forceps now form one unit.

While the apical thrust is maintained, the tooth is rotated distally; this single movement usually will rupture all the periodontal fibers, leaving the tooth free in its socket, at which time it may be removed by a mesial rotary movement combined with the force of extraction away from the alveolus in the long axis of the tooth.

2. In the extraction of double-rooted teeth (deciduous lower molars), the blades of the no. 74 forceps are applied along the axis of the mesial or distal root, not down the long axis of the tooth, and forced down the periodontal membrane to grip the cementum below the widest part of the root. Controlled apical thrust is applied before, and maintained throughout, the dilating movement. The tooth is moved lingually and will begin to lift from the alveolus at the end of the movement. This partially dilates the socket and ruptures most of the periodontal fibers. The operator, exerting neither apical nor extracting force and maintaining the same grip, moves the tooth across to the buccal side, thus further dilating the socket. At the end of this movement, the tooth is moved lingually again and extraction force is applied with a slight mesial rotation to detach the outer plate. This removes the tooth along its natural axis, the path of least resistance.

3. In the extraction of three-rooted teeth (deciduous upper molars), the blades of the no. 76 forceps are applied to the cementum of the palatal and distobuccal roots with a firm apical thrust. As the thrust is continued, the tooth is moved lingually. Correct summation of this thrust and movement throws the maximum force up the strong palatal root. The tooth now is carried across to the buccal side where it may be removed by applying the extraction force with a slight mesial rotation to dislodge the distally inclined buccal roots. If the first movement has been of sufficient amplitude, this final movement lifts the tooth free from the alveolus. The use of this technic assures minimum trauma to the underlying tissues and promotes early healing of the gingiva. The left hand is used to support the alveolar plates and in this way protect them from injury.

Turner Dental School, University of Manchester, Manchester, England

Repair of dental venturi nozzle

John V. Barfield. *M.Technicians Bul.* 10:199-200 Sept.-Oct. 1959

The venturi nozzle, a small but essential part of the saliva ejector used in the dental office, is not a durable item. The small orifice is easily obstructed by tiny foreign particles or by mineral deposits in some geographic areas. When this happens, the usual practice is to replace the venturi nozzle. When replacement cannot be made immediately, the efficiency of the dental operating unit is drastically decreased.

A simple and speedy method of repairing a worn-out venturi nozzle requires only a 17 gauge

hypodermic needle and some sticky wax. The needle will serve as a new lumen for the venturi nozzle. With a jeweler's saw or a separating disk, the hub of the needle is cut where the beveled edge meets the square portion of the hub. A small amount of wax is placed in the venturi nozzle and heated with any small flame to ensure a proper seal. A stylet or small wire may be held in the needle as it is placed in the venturi nozzle. After insertion, the stylet or wire is removed, leaving the needle open and clear of excess wax. The end of the needle is cut off just below the small opening inside the venturi nozzle. Dental wax forms a hard bond when cold water comes in contact with it.

Because the hypodermic needle is made of stainless steel, it should last much longer than the original copper nozzle. A little warm water will soften the wax and make removal of the needle as simple as its insertion.

Chennault Air Force Base, Lake Charles, La.

Incidence of infectious hepatitis in Danish dentists

J. H. Baunøe. *Tandlaegebl.* 63:407-417 July 1959

Thirty-five years ago, the simple insertion of dental instruments after use into boiling water was regarded as sufficient to prevent transfer of microorganisms from patient to patient and from patient to dentist. The temperature of boiling water is 100°C. (212°F.) and does not obtain sterilization but, at best, disinfection. Invasion by pathogenic microorganisms and reactions of tissues to their presence and to the toxins produced by them is still possible.

Although other sterilizing procedures, such as steam under pressure, dry heat, hot oils, silicone fluids and various chemical solutions, now are used in the dental office, the risk of infection is only reduced but not eliminated.

Occasionally dentists become infected by hepatitis virus IH and SH or A and B.

An investigation to determine the incidence of infectious (viral) hepatitis in Danish dentists has been carried out at the dental clinic of the Military Hospital in Copenhagen. A questionnaire was mailed to the 2,184 dentists practicing in Denmark, and answers were received from 2,148 dentists (98.4 per cent). The questions were as follows: (1) did you acquire infectious hepatitis before the eighteenth birthday? (2) did you acquire the disease after the eighteenth birthday? and (3) do you suspect that you acquired the disease by transmission from a patient?

The answers indicated that 345 dentists (7 per cent) had acquired infectious hepatitis, 163 of them probably by transmission from patients.

In 1952, Sten Madsen investigated the incidence of infectious hepatitis in Danish physicians and lawyers. He reported that 860 physicians (10 per cent) and 297 lawyers (7 per cent) had had the disease at one time or still had it.

Because the mortality rate has been estimated as being between 0.2 and 0.4 per cent, only surviving patients were considered in Madsen's and the present investigations.

Although dental instruments, in spite of the modern sterilization technics, may be inconspicuously contaminated with microorganisms, thereby serving as vehicles for infection, the occupational risk for dentists of acquiring infectious hepatitis can be considered comparatively small.

Militaerhospitals Tandklinik, Copenhagen, Denmark

Do you want trained dental assistants?

Arizona D.J. 5:126 Sept. 1959

For the second year, a career course in dental assisting will be presented at Phoenix Union High School. Thirty-seven girls have registered, and there is a waiting list. Applicants are screened and tested. Classes are held daily from 8:25 A.M. until 3:00 P.M. The course consists of about 1,000 hours and runs from September to June, closing with a graduation ceremony, including capping. Assignments include the care of equipment and room maintenance, and chairside assisting and on-the-job training gained at St. Joseph's Dental Clinic, at downtown and cottage offices, and at the John C. Lincoln Hospital Clinic.

The course is directed by Mrs. Helen D. Gipson. Lectures and demonstrations are given by general practitioners and specialists, and by qualified persons in nondental fields. Students participate in field trips. Charts, motion pictures, models and slides are used.

Subjects covered include personal hygiene, ethics, dental terminology, diet and nutrition, dental pathology, bacteriology and sterilization, dental anatomy and physiology, first aid, chairside assisting, anesthesia, dental health, applied psychology, pharmacology, roentgenographic procedures, laboratory procedures, business office procedures, and operatory procedures.

An advisory committee from the Central Arizona Dental Society assists in planning the course. Students become available for substitute office work in January. Class members also receive observation training, to acquaint them with different dental offices and the varied methods and technics used in dentistry.

The 13 graduates of the first class all were gainfully employed at close of school year.

15 East Monroe Street, Phoenix, Ariz.

Dentistry at its centennial crossroads

Reidar F. Sognnaes. *Science* 130:1681-1688 Dec. 18, 1959

Dental technology today is so good that people who can command the best have reconciled themselves to fillings, bridges and dentures, to pain and discomfort endured, to time lost and money spent. For the rest of the population and for the new generation, conventional repair will not solve the problem. Prevention is the only rational solution, research the only hopeful approach.

In the 1920's, only 12 of 43 dental schools in the United States had any funds earmarked for research, with less than $1,000 per year per school being spent for scholarly pursuits. Today, most of our 47 dental schools are in a position to conduct research. In the nation are at least 500 active dental science workers who have initiated various research projects basic to dental health. Fifty of the 1,000 scientists working in the National Institutes of Health now are engaged in work in dental science. A certain amount of dental research now has become a normal day-to-day activity in nearly all our dental schools.

Technological developments for saving teeth are being improved each year. In 1958 the American Dental Trade Association was told that up to 80 per cent of current sales of dental equipment and materials were products which only seven years before had been research curiosities. But even in some of the technological areas of dentistry there are still gaping voids. For instance, a much better material than silicate for filling conspicuous cavities in anterior teeth is needed.

The whole structure of standard restorative dentistry is still too much of a mechanical stopgap and not enough of a biological science. In principle, the filling of teeth is based on the admission that, within narrow limits, cavities cannot be healed. A substantial number of cavities can be prevented by the fluoridation of public water supplies—an intelligent step that unfortunately is vigorously opposed by a militant minority.

It is probable that more intensive research may reveal that some unknown ingredient of saliva, possibly organic, is of diagnostic significance and as important to the mouth as blood is to the rest of the body. This area is still wide open for research. Far too little is known about the deeper secrets of etiology, pathology and prevention.

Step one on the way to improved dental health is to implement the research training for dental scientists. This requires substantial long-term support, initially from the federal government and later from private foundations. A new strain of biological scientists with established interest and experience in dentistry should be trained within the universities. Even the smallest investments are sure to pay significant dividends.

Step two is to enable trained dental scientists to pursue basic research on a long-term basis. Step three is for these dental scientists to extend and deepen their collaboration with scientists and experts in other fields, in situations ranging from laboratory research to chairside and bedside patient care. Ultimately, this three-pronged approach will elevate the triad of teaching, research and service for dental health.

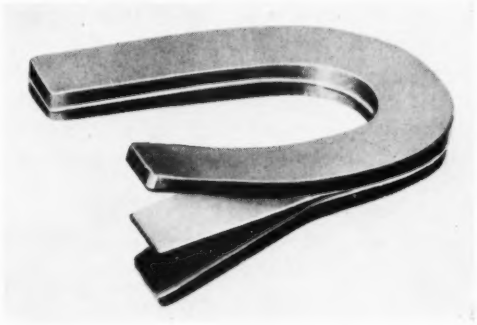
American dentistry, at its centennial crossroads, has a challenging future. The Pasteur and the Salk of dental health could well be just around the corner. To develop this new type of oral biologist is the best investment in dental health.

Harvard University School of Dental Medicine, Boston, Mass.

New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

"Coprwax" is a new bite wax packaged in boxes of 24 or 84 wafers, or in sheets in ½ pound and 5 pound boxes. Minute copper particles embedded in the wax are said to improve thermal conductivity. A thin sheet of aluminum foil is laminated between the layers of wax, to prevent teeth from cutting through. *Surgident, Ltd., 2124 S. Sepulveda Blvd., Los Angeles 25, Calif.*



A life-sized plastic human skull in natural bone color is said to be correct anatomically, and to be a scientific study aid for students as well as a tool for dentists and physicians in counseling patients. The skull is available in kit form or fully assembled. A spring-action mandible is said to simulate lifelike movement. The cap of the skull is removable. A display stand and anatomy chart are included. *Superior Plastics Inc., 426 N. Oakley Blvd., Chicago 12, Ill.*

"Lokon" retention beads can be dusted on facing areas of veneer crowns and bridges to provide maximum retention with minimum bulk. The beads are kept in place by a thin film of adhesive. Use of the beads is said to facilitate construction of thin veneers where the facing thickness must be minimal. A kit, providing enough material for thousands of jobs, consists of two sizes of beads, each size in individual plastic squeeze bottles, and a bottle of adhesive. *William Getz Corp., 7512 S. Greenwood, Chicago 19, Ill.*

An "Electro" lead pot and furnace is said to provide convenience and economy in the melting of lead, solder, babbitt and other metals. The one-piece insulated unit is available in capacities of 25, 45 and 75 pounds, with a temperature range from 600° to 1,000°F. The furnace uses less current than a flatiron and can be plugged into any convenient outlet. Literature is available. *Maurice Fetterman Co., 1170 Broadway, New York 1, N.Y.*

A double plastic envelope for packaging its "Davis & Geck" surgical sutures has been designed by American Cyanamid Company's Surgical Products Division. The new package is made of a transparent, laminated plastic film. The suture strand is coiled and wrapped in an identifying label and sealed in a small plastic envelope, which in turn is sealed within a larger transparent wrapper. The suture and inner envelope are sterilized by gas under pressure. *American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

A radiographic cephalometric study of the facial profile in individuals with complete dental prostheses. *Donald A. Apfel. 1959.* M.S.D. *Northwestern University.*

A radiographic cephalometric evaluation of skeletal facial height in children with Class II, Division 1, malocclusion (Angle). *William R. Behm. 1959.* M.S.D. *Northwestern University.*

Clinical study of the surface characteristics of the gingiva. *(Howard) Suryakanthama Anamiah. 1959.* M.S. *Ohio State University.*

A study of mandibular condyle movements and positions. *William Sigmund Masters. 1959.* M.S. *Ohio State University.*

A study of the muscles of the lips using the electromyograph. *Robert Ian Nairn. 1959.* M.S. *Ohio State University.*

A cephalometric study of the maxillary permanent first molars in Class II Division 1 treatment. *Toetie Ch. Sohoed. 1959.* M.S. *Ohio State University.*

'Normal' mucosa under dentures. *John Bright Sowter. 1959.* M.S. *Ohio State University.*

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Contents

Oncology

Cancer in a dial painter. *Glenn*.....387
Ectopic salivary gland tumor. *Dalley*.....388
Cancer of the tongue. *Petrov*.....389

Anatomy

Roots of lower bicuspids. *De Jonge*.....390
The deciduous tooth germ. *Onda*.....392

Operative dentistry

Dental units on U.S.S.*Nereus*. *Carter*.....393
Fillings of polystyrene. *Jarby*.....394
Test of cavity liners. *Pappas*.....394
Jacket crown preparations. *Halson*.....395

Anesthesia and analgesia

Effects of analgesics. *Geffert*.....396
Measurements of pain. *Monje*.....397
Convulsions during anesthesia. *Kucher*.....397
Trichloroethylene supplement. *Spiro*.....398

Prosthetic dentistry

Articular spring bows. *Heydenreich*.....399
Transferring a restoration. *Barone*.....400

Oral surgery

Inexpensive ice bag. *Reese*.....402
Onlay-inlay metal splint. *Robinson*.....402
Ostamer in dentistry. *Munoz*.....403
Neck and jaw resections. *Gaisford*.....403
Cue tip in parotid gland. *Wherry*.....404

Endodontics

Fine root canals. *Buchbinder*.....405
Oil of clove and eugenol. *Pohto*.....405
One-visit endodontic treatment. *Adrian*.....405
Para-aminotoluene sulfonamide. *Gurney*....406

Extractions

Postoperative osteitis. *Quinley*.....407
Indications for extractions. *Aldus*.....407
Dental sinusitis. *Björk*.....408
Diagnosis of hemophilia. *Waaler*.....408

Pedodontics

Sex and tooth eruption. *Adler*.....409
Calcification of teeth. *Hotz*.....409
Evaluation of antisialogogues. *Newton*.....410
Molar loss and caries. *Finn*.....410

Orthodontics

Response to McNeil method. *Hotz*.....411
Effect of vibration. *Spaulding*.....412
Occlusion and tooth eruption. *Bambha*.....412

Periodontics

Saline and astringent packs. *Padgett*.....413
Role of periodontal trauma. *Gratzinger*.....413
Periodontics and gerodontics. *Böhne*.....414

Case reports

Cleidocranial dysostosis. *Laniejew*.....415
Mouth breathing and nasal obstruction.....415
Cleidocranial dysostosis. *Sclare*.....416
Mottling of palate.....416
Occupational disease of dentists.....416
Cheilosis and angular stomatitis.....417
Aphthous stomatitis 417

Roentgenology

Exposure of dental personnel. *Miller*.....418
Fluoroscopy of the healthy child.....418
Roentgen film lettering foil. *Czech*.....419
Gonad dosage in dental office. *Bissing*.....419
Gonad exposure of children. *Williamson*....419
Gonad radiation in town. *Norwood*.....420

Therapeutics

Uniformity of drug names. *Leake*.....421
Diet and dental fluorosis. *Dibák*.....421
Allergic emergencies. *Patterson*.....422
Medication of dental patient. *Monheim*.....423
A new sedative. *Linenberg*.....424

Public health dentistry

Caries and diet in history. *Hardwick*.....425
Care for indigent children. *Quinn*.....426
Untreated cleft palate. *Law*.....427
Askov dental demonstration. *Jordan*.....428

Histology

Leukocytes in saliva. *Calonius*.....429
Electron microscopy of teeth. *da Silva*.....429
Mineralization of enamel. *Allan*.....430
Studies on dental caries. *Shiota*.....431
Morphologic study of enamel. *Gustafson*....431
Apical granulomas. *Obrucnik*.....432

Pathology

Silica in soft tissues. *Fox*.....433
Hypertrophy of masseter. *Oppenheim*.....433
Leukemic reactions. *Engelhardt*.....434
Development of cleft palate. *Walker*.....434
Superstition and tonguetie. *Cullum*.....435
Changes of oral mucosa. *Lebourg*.....436
Transient bacteremia. *Linzenmeier*.....436
Unrecognized diabetes. *Schliack*.....437
Acute leukemia. *Sugar*.....437
Rhythm of tooth mobility. *Hirt*.....438

General

Philately for dentists. *Lützelberger*.....439
Extracting deciduous teeth. *Ashcroft*.....440
Repair of venturi nozzle. *Barfield*.....440
Infectious hepatitis in dentists. *Baunøe*.....441
Course for dental assistants.....441
Future of dentistry. *Sognnaes*.....442

New equipment

Equipment news.....443

Doctoral and Masters' dissertations

Dissertations.....444

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Index of authors

Adler, Peter 409
Adrian, Shahan A. 405
Aldus, A. E. M. 407
Allan, J. H. 430
Ashcroft, G. 440
Atwell, Robert B. 403

Bambha, Jagdish K. 412
Barfield, John V. 440
Barone, Joseph J. 400
Baunøe, J. H. 441
Best, E. James 406
Bissing, Josef 419
Björk, Harry 408
Böhne, Ch. 414
Boulanger, G. 409
Buchbinder, Maurice 405

Calonius, P. E. B. 429
Carter, Roamer C. 393
Cullum, I. M. 435
Czech, W. G. E. 419

Dalley, V. M. 388
da Silva Sasso, Wilson 429
De Jonge, Th. E. 390
Dibák, O. 421
Dirlam, James H. 424
Donaldson, E. E. 420

Engelhardt, Hans G. 434

Finn, Sidney B. 410
Fox, E. C. 433
Fulton, John T. 427

Gaisford, John C. 403
Galindo, Joseph 387
Geffert, Robert 396
Glenn, James A., Jr. 387
Gordin, R. 429
Gores, Robert J. 407
Graf-Pinthus, B. 411
Gratzinger, Max 413
Gremilov, V. A. 389
Gurney, Benjamin F. 406
Gustafson, Anna-Greta 431

Halson, T. S. 395
Hanna, Dwight C. 403
Hardwick, J. L. 425
Harpole, H. James 424
Healy, J. W. 420
Heydenreich, F. 399
Hirt, Helmut A. 438
Hotz, R. 409, 411

Jarby, Sven 394
Johnson, Robert A. 428
Jordan, Wm. A. 428

Kinnsman, Simon 418
Kirklin, C. W. 420
Kucher, R. 397

Laniejew, Helena 415
Lautenbach, Ernst 436
Law, Frank E. 427
Lawrence, Clinton E. 387
Leake, Chauncey D. 421
Lebourg, L. 436
Lee, J. Gordon 404
Linenberg, William B. 424
Linzenmeier, Götz 436
Lützelberger, Rolf 439

Marsland, E. A. 433
Massler, Maury 394
Meduna, Josef 432
Miller, James W. 418
Monheim, Leonard M. 423
Monje, M. 397
Morrison, Richard D. 410
Munoz, Jose E. 403

Newton, W. Neal 410
Norwood, W. D. 420
Obrucnik, Miroslav 432
Onda, Senji 392
Oppenheim, H. 433

Padgett, James L. 413
Pappas, Aphrodite 395
Patterson, Roy 422
Pawsey, O. M. 440
Peterson, John K. 428
Petrov, Iu. V. 389
Pohto, Mauri 405

Quinley, James F. 407
Quinn, Galen W. 426

Reese, Robert T. 402
Richter, W. 397
Ritter, O. 397
Robinson, Marsh 402
Roesch, W. C. 420
Royer, R. Quentin 407

Scheinin, Arje 405
Schliack, Volker 437
Sclare, Rachel 416
Semjan, M. 421
Shiota, Kenji 431
Snyder, John R. 428
Sognnaes, Reidar F. 442
Souza Santos, Helena 429
Spaulding, Frederick W. 412
Spiro, Stanley R. 398
Steinbéreithner, K. 397
Stockman, Robert L. 418
Sugar, L. 437

Terry, John L. 403

Van Natta, Pearl 412

Waaler, B. A. 408
Walker, Bruce E. 434
Weisshaupt, H. 409
Wherry, David C. 404
Williams, A. B. 419
Williamson, B. D. P. 419
Wing, M. 433
Woelfel, Julian B. 400

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